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# AUTOMOTIVE INDUSTRIES

## *The* AUTOMOBILE

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# AUTOMOTIVE INDUSTRIES

## The AUTOMOBILE

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## Why Shouldn't We Pay More for Parts?

Replacement business bears more than its share of sales cost because original equipment prices fail to provide profit to parts maker. Conditions change.

By Norman G. Shidle

**W**ITH competition growing keener every month and with vehicle builders trying to hold steady a constantly diminishing margin of profit, the position of the parts maker is due for serious consideration.

Car manufacturers in general are trying hard to cut selling and production costs. Their profits have not increased in proportion to their production for several years and higher prices are being talked of as a means of giving both dealers and manufacturers a greater margin on which to operate.

Vehicle manufacturers are entirely justified in seeking some means of increasing net profits at this time. The public gets more for its dollar when it buys an automobile than when it buys any other product today and the industry might raise prices and still give the buyer full value for his money. Marketing costs for the car builder as well as for the parts maker have gone up rapidly in the last few years.

The parts industry is certain to feel some pressure from this very necessary effort by car manufacturers to widen the gap between income and expense. Such pres-

sure already is being applied in some instances. In this situation the basic economics of the parts maker's position and the future trend of his original equipment sales are ripe for analysis. Certain general tendencies appear which, while they may not affect the immediate future to any material extent, have a very definite bearing on a long swing view of the industry.

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**T**HE entire industry will benefit in the long run if the parts manufacturer becomes able to sell every unit he makes—whether for original equipment or replacement business—at a reasonable profit. The car manufacturer will have more stable sources of supply, better assurance of steady quality, and a firmer financial condition for the whole industry.

The advertising value of having a part used for original equipment often has been overestimated. The influence of the dealer and the convenience of buying have far more effect on replacement parts sales than any other factors.

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long swing view of the industry.

Buying demand always has influenced prices in every industry and it always will. Prices of automotive parts used for original equipment, however, have been held to a relatively low level for many years. The parts maker who provides units to the car manufacturer often has failed to cash in on prosperous periods to the same extent as some other sections of the industry.

This condition has resulted partly from the fact

that a large number of parts purchased by the car and truck manufacturers have been obtained practically at cost or less than cost, replacement sales being depended upon to assimilate the expense of doing original equipment business. This practice has been common in nearly all parts lines, except those in which there is only a very small replacement market. Tires, spark plugs, piston

rings, and other units have been bought by the vehicle manufacturer for many years at a price which would not have permitted the parts maker to stay in business had he not made his profits from replacement sales.

A custom which has existed for so long a time and which has become so fully a part of automotive purchasing practice is certain to have some reason for being, despite the fact that it does not seem to be in accord with sound economic principles. Briefly, the case for the practice of selling original equipment without profit may be stated in the words of an executive of a prominent tire company:

#### The Case for the Affirmative

1. "A definite advertising value accrues from having a tire on a car when it goes into the hands of the owner. If it gives him good service, he is likely to buy the same make when replacement becomes necessary."

2. "The low prices charged for tires and other parts make it possible for the car manufacturer to set a lower price on his vehicle than would be the case if he were charged profit-making prices for the parts he buys. Low car prices result in wider distribution of automobiles and thus create a larger replacement market for the parts maker."

3. "The quantity production of parts made possible by supplying original equipment to car manufacturers reduces overhead expenses for the parts maker and enables him to have a larger margin of profit on his replacement sales than otherwise would be possible."

The last of these reasons is the one most frequently advanced in support of the current practice.

There can be no doubt of its validity up to a certain point. Quantity production does reduce unit manufacturing costs. The remarkable progress of the automotive industry as a whole has been predicated on that basis and the success achieved bears out its soundness.

But it is possible to get too much of a good thing. The

"THERE is such a thing as getting too much business," a prominent parts maker said the other day. "Some parts manufacturers in the past have gone after certain business which they wanted and have obtained it at the expense of profits. These producers now are realizing their folly. Volume output actually reduces overhead costs only when it is constant, so that a large part of the factory can be kept in operation at all times."

Need exists for close cooperation between parts and vehicles manufacturers both as regards original equipment purchases and replacement sales. Both car and parts makers must make consistent profits if they are to continue to be successful.

lower production costs permitted by supplying original equipment have been offset in some cases by the very low levels to which prices for such equipment have descended when considered in relation to manufacturing and merchandising costs.

Just as the car builder's sales cost has been growing very rapidly of late, so is it costing the parts manufacturer more to make replacement sales today than it ever did before. While prices of original equipment may not

be relatively any lower than they ever were, the cost of selling in the replacement field gradually has been creeping, almost imperceptibly in some cases, so that the parts going to dealers and jobbers no longer are capable of bearing the excess share of merchandising cost with which they have had to be burdened in the past because parts sold to the car manufacturer did not return a profit.

Only a very careful study of costs in any particular instance can determine the exact relation between the economies obtained through quantity production in building equipment for car manufacturers and the possible profits in the replacement field. The possibilities of volume alone as a profit maker probably have been overestimated to some extent, however, in recent years.

The advertising value of having a part used for original equipment undoubtedly has been overestimated. Even a unit such as a tire, which is visible to the eye of every car buyer, no longer benefits materially from the publicity gained through its use on the car when originally sold. Convenience in buying, price and recommendations of the dealer all are powerful factors in influencing replacement tire sales. And of these three, the effect of the dealer's opinion probably is the greatest. Provided he handles reputable brands which will give good service at a low price, the retailer can sell to a customer whatever tire he likes in a majority of cases.

The influence of the dealer is even greater in the case of other replacement units not so readily visible to the average owner. When a car needs some part replaced the owner turns naturally to the dealer from whom he bought the car in the first place. He takes the vehicle to that dealer, asks him what is the matter with it and tells him to replace whatever parts are necessary. Only in relatively few cases will the owner insist on having a specific make of part. He is interested chiefly in having the machine operate properly and he usually feels that the dealer from whom he bought it is responsible for keeping it in shape. In most instances the dealer puts into the car whatever parts he thinks best. If the dealer is sold on a part and finds it profitable to handle, that part is very likely to go into a large proportion of the cars serviced in that dealer's establishment.

It is significant that even the cigarette manufacturer who tells the public that men will walk a mile to buy the brand made by his company doesn't put his statement to the test. He sees to it that his product is so widely distributed that anybody can buy it without having to walk a single step further than would be necessary to buy any other cigarette. His merchandising scheme recognizes clearly the fact that convenience in buying is one of the most important factors influencing distribution.

#### Convenience Influences Buying

This rule holds good as regards every product bought by the public at large. If a car owner can get a good spark plug next door to his house he isn't very often going to drive a mile or two to get one of the make with which his car was equipped originally—even if he does know what it was.

Practical experience indicates clearly that convenience in buying and the influence of the dealer have a great deal more bearing on parts sales than does the slight advertising value accruing from use of the part as original equipment.

It is one thing to point out that original equipment sales made without profit are a detriment to the parts makers' business and to the industry as a whole and another to show how the situation can be changed in any particular instance. A practice which has been current



for a number of years cannot be overturned in a few weeks, nor is it desirable that it should be. It has become evident, however, that parts going to car manufacturers must be sold at a reasonable profit if stable sources of supplying are to be continued and the entire industry is to go forward in the future on as sound a basis as it has in the past. Present marketing conditions demand elimination of waste which once might have gone by unnoticed.

### Unprofitable Plant Closed

The contention that current conditions necessitate a readjustment of viewpoint as regards the relation between profits and production is given further support by a somewhat radical move just made by one of the most prominent parts makers. In a letter to its stockholders this company points out that "the natural desire on the part of the directors to earn profits sufficient to resume common stock dividends has led to very serious consideration of our problems." This same condition exists in many other parts organizations.

Stating its specific case in the same letter, this company gives a good specific example of a rather general situation. Pointing out that operations in one of its plants has been unprofitable for several years and that it has been decided to shut down that particular factory, the letter goes on to state that "the competition has been so keen that contracts for large quantities of smaller sizes of axles have been taken at cost or less, in an effort to keep the plant filled up and thereby reduce the cost of the larger sizes. Even this has not been successful," the letter states, "because of the failure of our customers to take the quantities contracted for, and the inevitable increase in overhead expenses when schedules are radically reduced."

Here is an instance in which a parts manufacturer has studied the situation carefully and simply has made up his mind not to pursue quantity production mirages any further. He investigated the unit costs and unit profits of each of the lines which he is building and determined those on which he is making a profit consistently. Then he decided to stop making those units which aren't bringing in any financial returns and to put all of his effort into selling those which do pay.

While the case cited does not involve a manufacturer whose replacement business constitutes a major share of his total sales, it does illustrate clearly the general trend. If it is uneconomic for parts organizations with a large replacement business to sell original equipment without a profit, it comes close to being slow suicide for those which depend primarily on original equipment sales for a livelihood.

The practice of selling to manufacturers at very low prices has had an important effect on the entire parts distribution system as well as on the profits of the parts maker directly. While these low priced units are supposed to be for original equipment only, they find their way into the hands of retail dealers from time to time and thus complicate the regular channels of distribution. In the tire field, for example, one of the disturbing influences in the retail market for some time was the fact that a good many tires, sold to car manufacturers at cost or less, got into the hands of car dealers at a price which made it possible for them to undersell the retailers who obtained tires through the regular manufacturer-to-branch-to-dealer or manufacturer-to-jobber-to-dealer route. A few accessories are being relayed to car dealers today through car manufacturers under price conditions which make it unprofitable for a jobber to handle the particular accessory line.

This practice is not common at the present time and there is little indication that it is going to grow to any material extent. It is mentioned, however, as another of the unfavorable trends growing out of sales to manufacturers on a non-profit making basis.

The ability and desire of the public to buy is the final factor in determining automotive prosperity. The public has to pay the same amount for its automotive transportation whether original equipment prices yield profits to the parts makers or not. The sales economics of any part, such as a piston ring, sold extensively for replacement may be taken as an example.

When the ring sold for original equipment fails to give a profit to its manufacturer, the price of the rings sold for replacement must be so adjusted as to give a higher profit than would be necessary if the entire output of the piston ring plant were sold at a profit.

It may be argued that the average car owner does not

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ONLY a very close study of costs in any particular instance can determine the exact relation between economies obtained through quantity production in building equipment for car manufacturers and possible profits in the parts replacement field.

The possibilities of volume alone as a profit-maker probably have been overestimated to some extent in the past. The action just taken by one important parts concern is of interest in this connection. The company in question has decided to close one of its plants which has been manufacturing units sold at cost or less than cost. It plans to concentrate its efforts in selling those lines which help to pay dividends.

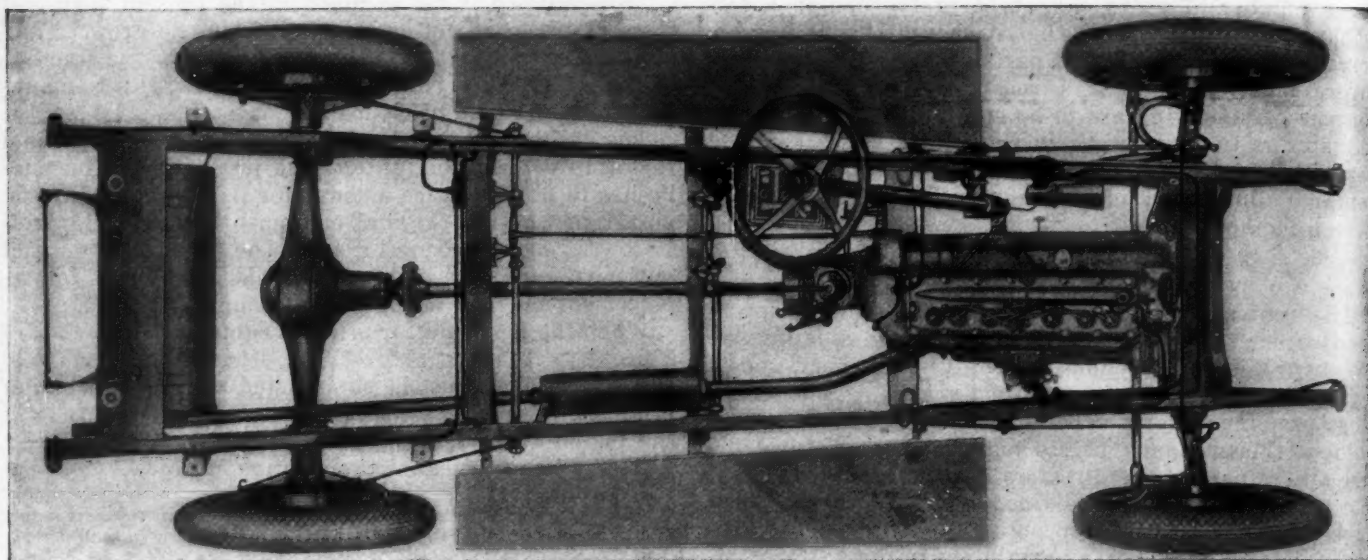
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understand this fact and that he would balk at higher car prices. This is true to some extent, but it is equally true that more drivers every year are coming to count the cost of service and operation as more important items than the original cost of the vehicle.

If original equipment parts prices all were made to yield a profit, it would be reasonable to expect the price of vehicles to go up in proportion. But since the increase would have to be general, no particular maker would be affected much more than any other. This is true because the parts chiefly affected by the question under discussion are those which most car manufacturers buy from outside sources.

### Effect of Prices on Sales

A good many automobile salesmen, moreover, will confirm the idea that it is easier to get a few dollars more out of a man at the time he makes his original purchase than it is to take it away from him in small bits. A man buying a new car may be influenced to purchase \$25 or \$50 worth of accessories more easily and at less sales cost than he could be sold the same group of accessories one at a time later on. This same line of reasoning will apply in the case of parts, except that the man is compelled to buy the parts later whether he wants to do so or not. But his general attitude toward the car probably would be more favorable if, in these numerous small purchases he had to pay a price which he considered low, even though he had to pay a bit more when he bought the car in the first place.



*Four-wheel brakes are shown on this chassis, though they are optional rather than regular equipment, and the oil lines are featured*

## New Cleveland Model Has Centralized Chassis Lubricating System

Nearly all mechanical units are redesigned and wheelbase is lengthened. More powerful L-head engine is fitted. 31x5.25 in. balloon tires are standard equipment. \$50 extra for four-wheel brakes. Two sedans, two coupes and two phaetons in body line.

**L**EAVING the ranks of manufacturers of cars with valve-in-head engines, the Cleveland Automobile Co. has brought out for 1925 an entirely new car with an L-head six-cylinder engine. Practically every unit in the car has been altered and improved as compared with the 1924 model. The new product has a longer (115 in.) wheelbase, is equipped with a larger engine and is strengthened generally throughout.

Bodies, of which there are six styles, have been improved in many details. Standard equipment now includes 31 x 5.25 in. balloon tires and centralized chassis lubrication. The cars have a price range from \$1,095 to \$1,495, with four-wheel brakes optional at \$50 extra.

This car is claimed to be capable of acceleration from 5 to 25 m.p.h. on high gear in less than 7 sec., and is said to be capable of attaining 65 m.p.h.

The new  $3\frac{1}{8}$  by  $4\frac{3}{4}$  in. engine, it is asserted, developed a maximum of 60 hp. at 2800 r.p.m. as compared to 45 hp. at 2200 r.p.m. for the earlier model. It is also claimed that the car will average better than 20 miles per gallon of fuel with any style of body.

A test is said to have been made at the factory on one of the production engines which was operated for the equivalent of 10,000 miles at 50 m.p.h. It was found at the conclusion of the test, it is claimed, that the power had increased slightly and the engine could be slowed down to 82 r.p.m. with wide-open throttle and full load, firing regularly and steadily, indicating that the evenness of compression had not been affected.

A fairly high compression is employed, the clearance space being  $21\frac{1}{2}$  per cent of the total volume. The form of the combustion chamber is such as to produce considerable turbulence. The chamber is domed over the valves and tapers down on the opposite side to the minimum practical clearance,  $1/32$  in. plus the gasket thickness.

The cylinder block is cast separately from the crankcase, which extends down  $2\frac{1}{2}$  in. below the centerline of the crankshaft. The camshaft is placed in the right side of the crankcase instead of the left as previously, so that the shaft is now in the path of the oil thrown by the crankshaft, giving more oil to the cam surfaces, camshaft bearings and tappets and decreasing the amount of oil thrown into the cylinder barrels. The breather, with this new arrangement, is moved to the left side of the case away from the oil throw. The breather is placed at the center of length of the crankcase with the intention of helping keep the oil fumes away from the closed bodies.

Large water passages surround each cylinder and each valve. The water enters directly below the valve passages with equal distribution to both ends of the block. Cooling is claimed to be extremely uniform, with a maximum variation of 3 deg. Fahr. Cylinder bores now are given a honed instead of a ground finish.

Many experiments were made to secure the shape of the head and the best positioning for the spark plugs. A location somewhat nearer the inlet valve than the center of the head proved to be most satisfactory.

A good example of the increase in sturdiness of the new



model as compared with the old is the crankshaft, which weighs 67 lb., as against 50 lb. in the earlier model. Main bearings are now bronze backed instead of plain die cast, and are of the shimless, grooveless type. Main bearing dimensions are as follows: Front, 2 7/32 diameter x 2 1/2 in. long; center, 2 1/4 diameter x 2 5/8 in. long; rear, 2 9/32 diameter x 3 3/8 in. long.

Pistons have long skirts, as in the previous model, but now have two plain 1/8-in. rings instead of 3/16. There is also an oil scraper ring while beneath the lowest ring is an oil groove with vent holes intended to reduce the amount of oil entering the combustion chamber. Piston clearance, as before, is .003 in., and the piston is relieved on the sides at the ends of the piston pins.

#### Bearing Metal Poured in Rod

Connecting-rods also are changed in that the bearing metal now is poured into the rods under pressure. Bearings are the shimless type broached to .003 in. clearance. Cap bolts have been increased in diameter from 3/8 to 7/16 in. The rods are 10 1/4 in. long, center to center, and are held to within 1/3 ounce of uniform weight. A bronze pin bushing is employed.

Morse silent chain drive is used in the new model, as it was in the former design, but the entire front end has been redesigned. There are now 61 links in the chain as compared to 71 formerly, the center distances being different and the sprockets now having respectively 21, 42 and 16 teeth as compared with 21, 42 and 14. The change increases the contact area of the chain with the sprocket and also meets the recommendations of the chain manufacturers for a greater number of teeth on the accessory shaft drive sprocket.

It is no longer necessary to remove the radiator, chain cover, etc., to remove the generator. This operation can be done now by simply removing the coupling and three supporting screws.

Four bearings are used on the camshaft which drives

the valves through roller followers. Valves are 1 5/16 in. clear diameter and have 30 deg. instead of 45 deg. seats to give quicker and greater opening for the same lift. Another change in the valve is the elimination of the relief on the stem of the valve which experience showed to be a carbon collector and consequently a cause for sticking valves. Instead of the stem relief there is a taper relief on the guide which is not so apt to collect carbon, it is claimed, and if carbon is collected sticking is unlikely.

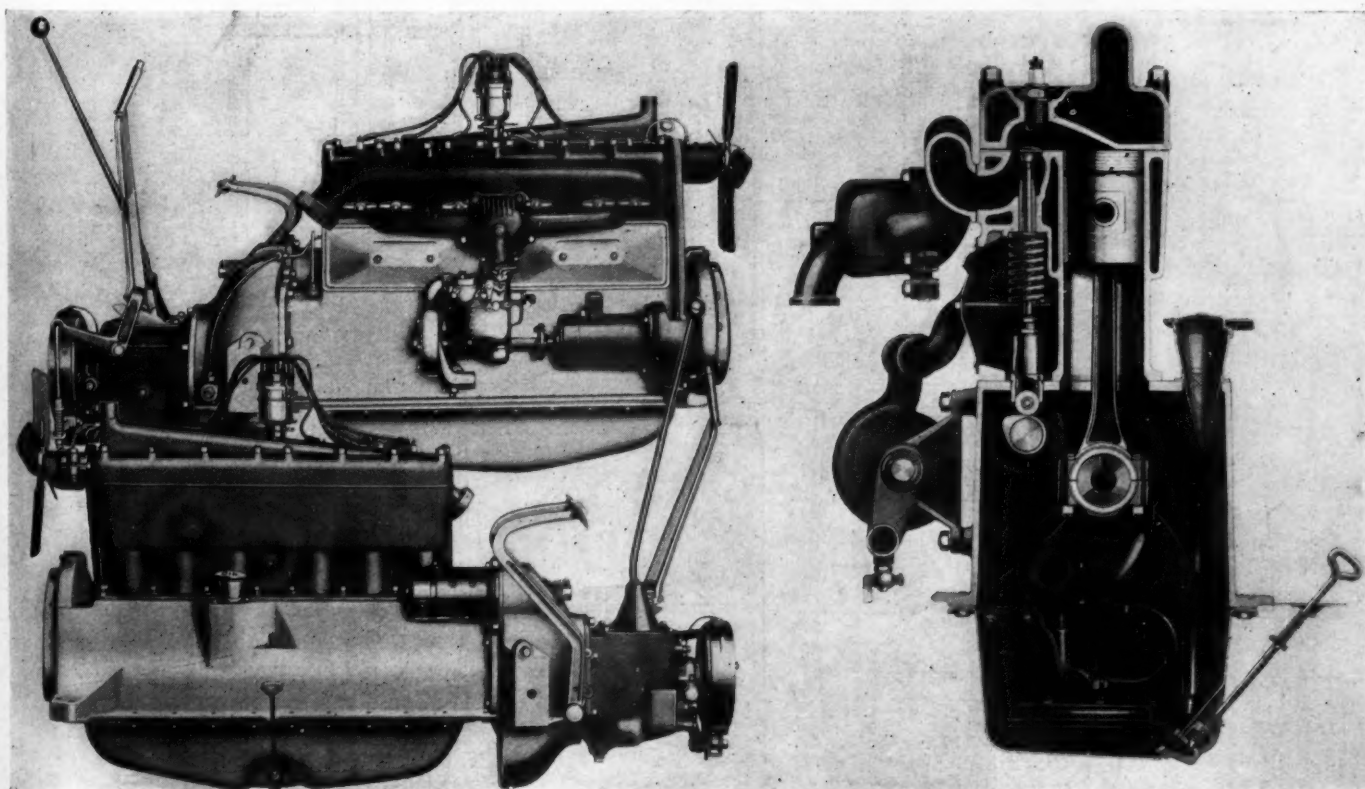
Double valve springs, adopted by Cleveland last year, are continued this year, but there is less tension on the spring when the valves are closed, thereby relieving the mechanism of wear and permitting less impact against the seats.

Pressure lubrication, with leads to all parts of the engine, is supplied from the two-gallon reservoir in the oil pan by a gear type pump driven by spiral gears from the camshaft. Oil first passes through a screen into the pump. Thence it passes through three large pipes directly to the under side of the three main bearings and then through the hollow crankshaft to the connecting-rod bearings and around the main bearings to the camshaft bearings. At 20 m.p.h. 1 1/2 gal. of oil is circulated through the engine every minute. Oil consumption is claimed to vary from 1000 miles per gal. at low speeds down to 500 miles per gal. at high speeds.

#### Water Pump Positively Driven

Cooling is by pump as formerly, but the pump now is positively driven through a flexible coupling instead of by triangular belt. The water pump bearing size has been increased, and there is but one packing gland instead of two. The radiator now is made by the Cleveland company itself. A fan of 15 1/2 in. diameter instead of 13 in. now is used. The belt is no longer in front of the fan but is behind the fan bearing, making a better balanced drive.

The oil reservoir in the fan bearing is larger and it is now replenished from the one-shot oiling system, which



The two sides and a cross section of the new Cleveland engine

also takes care of the chassis lubrication. Springs now are installed under the radiator hold-down bolts so that under rough usage the core is more free from strain, thus reducing the chances for core leakage.

A Bosch electrical system having a two-unit starting and lighting installation and automatic spark advance mechanism is employed. The ignition advance is arranged to break at upper center with the manual advance, with 18 deg. more advance automatically controlled.

#### Choke Discarded

Fuel is fed by vacuum tank to a Schebler model S-1 carbureter. The latter is an air-valve type made without a choke in the air passage so that the amount of raw gasoline drawn into the engine in starting will be minimized. That portion of the intake manifold between the horizontal section and the carbureter is surrounded by an exhaust jacket through which the exhaust from the three forward cylinders passes. The intake manifold is a straight-line type with rather abrupt turn and is designed to make the characteristics of the gas passage from the carbureter to each cylinder similar.

A late type of the 10-in. Borg & Beck clutch, in which the release collar is pushed forward instead of pulled back in releasing is employed. Driven parts of this clutch are considerably lighter and the overhang of the transmission gearset considerably less than with the old type.

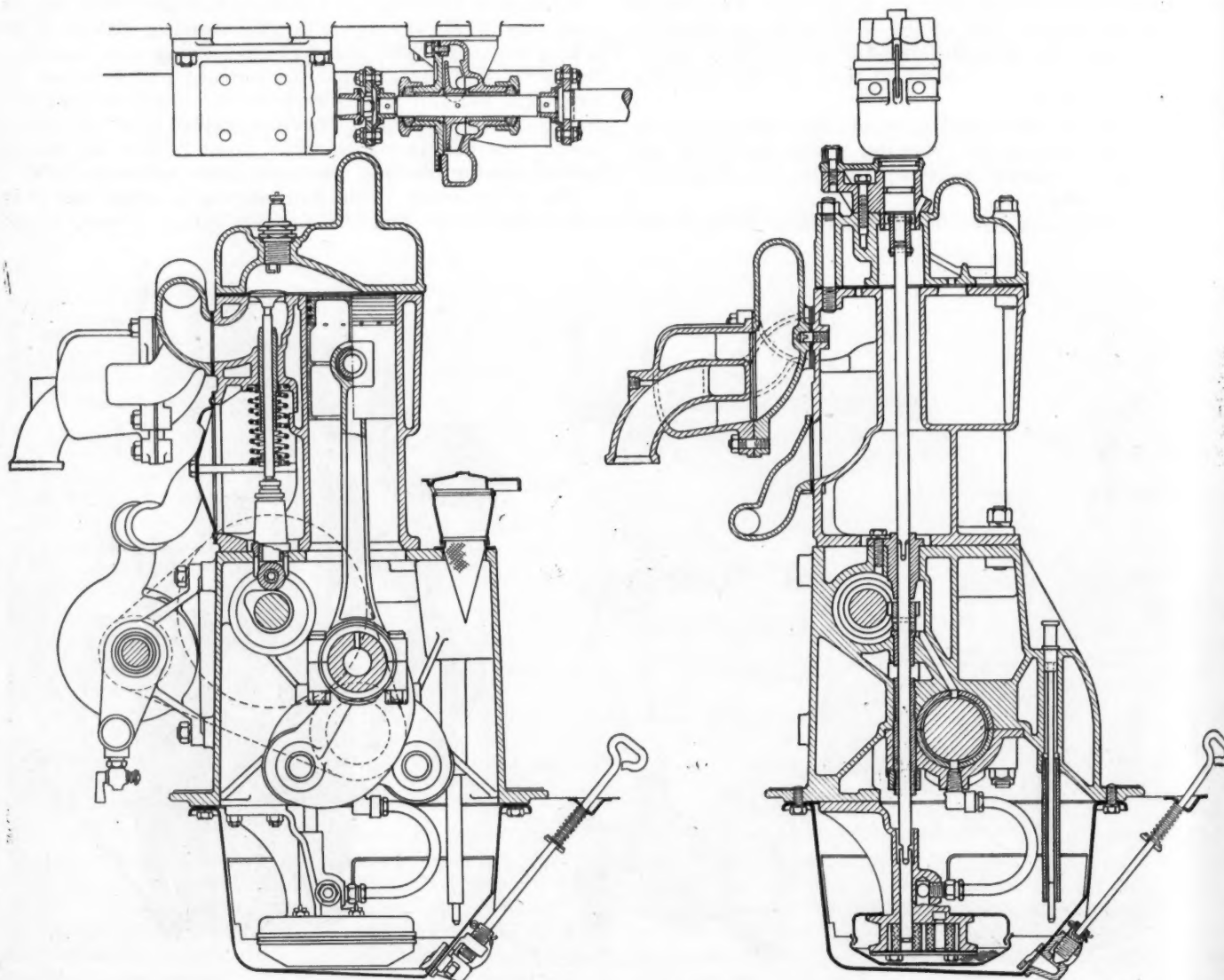
A gearset which is heavier throughout is a part of the unit powerplant. Shaft diameters are larger and gears now are made of U.M.A. high-carbon chrome alloy steel. A closed bellhousing now is used to join engine and gearset.

Large ball bearings replace the roller type, and there is a longer shifter lever.

#### Final Drive and Front Axle Design

Final drive is through a hollow propeller shaft with flexible rubber disk universal joints. The rear axle is a floating design using Timken bearings. This axle is similar to the previous unit, but is heavier to take care of the greater torque. It is made completely in the Cleveland plant. A front axle designed to take the optional front-wheel brakes is now the Elliott instead of the reverse Elliott type formerly employed, and it is stiffer in torsion. As before, taper roller bearings are used for the front wheels.

When front wheel brakes are installed, the front brake, anchor support brackets etc., are attached to brake carrier disks which transmit the stresses to the steering knuckles. Owing to the stresses imposed on this disk it is provided at its center with a rectangular shaped opening which fits over a similar boss on the steering knuckle forging. While held in place by four countersunk screws, these do not take the braking stresses, the rectangular boss performing this function.



Water pump and generator drives (upper left hand corner), and two end views of Cleveland engine



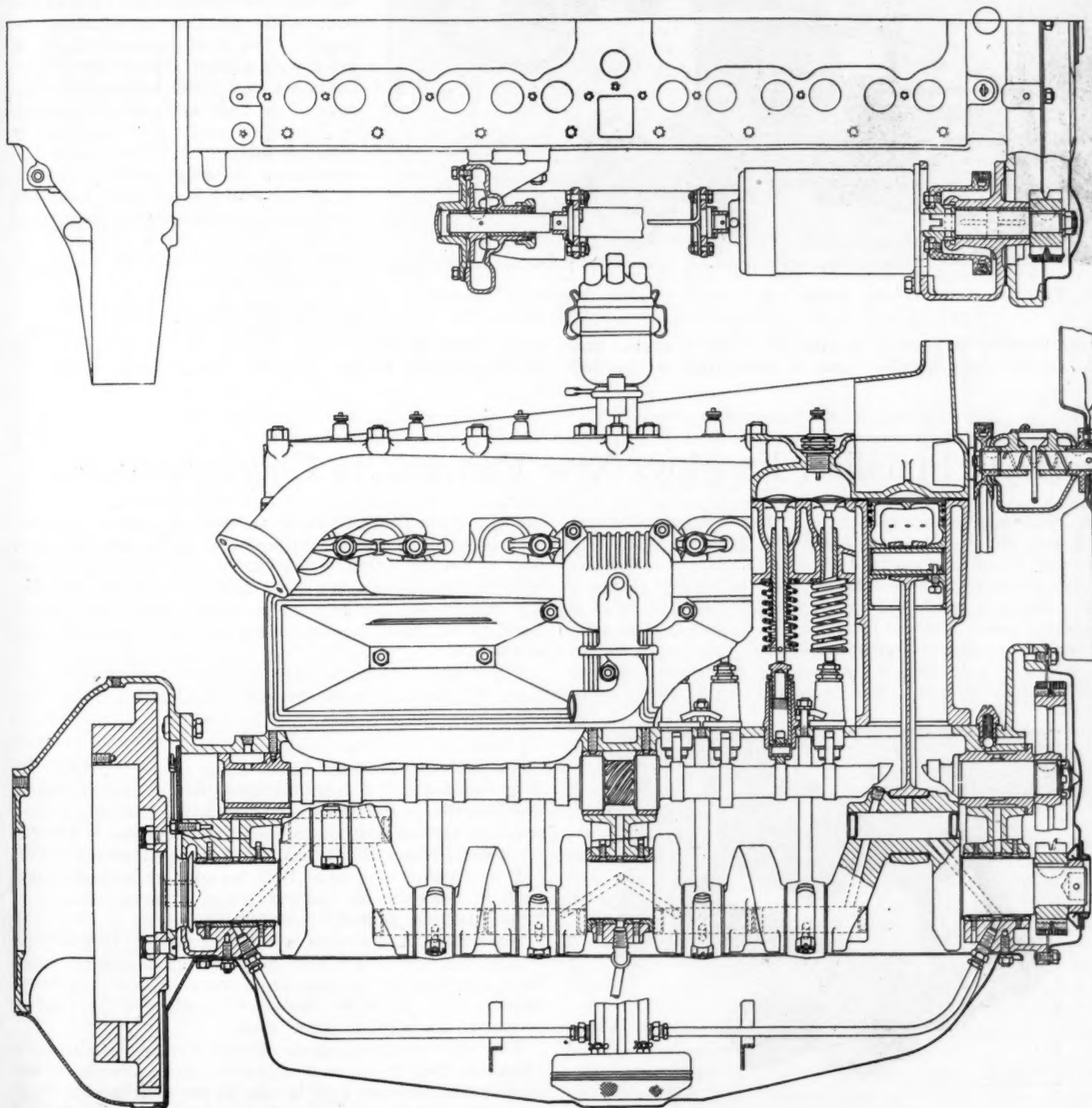
Front brakes and operating mechanism are interchangeable with the rear. The brake rods from the forward brake cross shaft do not run direct to the brake band levers but instead to levers at the ends of small cross shafts supported on the front axle. The outer ends of these short shafts terminate in ball type universals which stand directly in line with the axes of the steering knuckle pins through these universals the load is transmitted to the second brake levers which are supported on the steering knuckle forgings and therefore turn with them when the front wheels are moved as in steering.

From these second short levers the motion is transmitted to the brake band levers through the medium of short links. The inner ends of the short cross shafts rest in ball and socket joints to provide flexibility and eliminate bending. The short shafts are covered with leather boots.

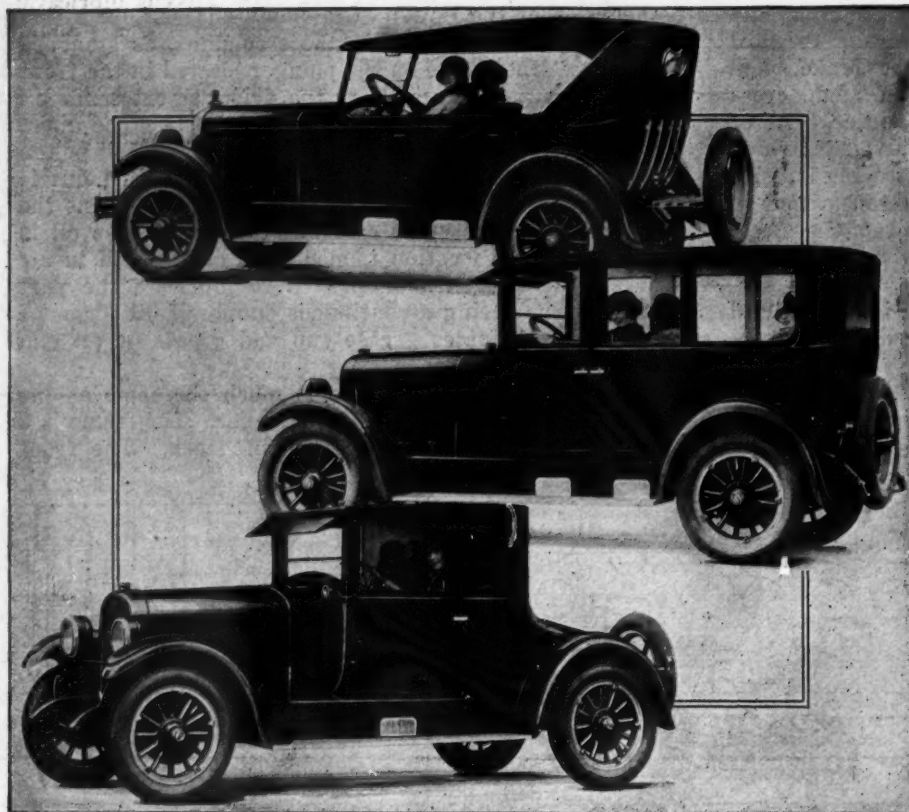
One of the most noteworthy features of the new car is

the adoption of the Bowen "One-Shot" chassis lubrication system, recently described in these columns, as standard equipment. One stroke on the plunger located in the front compartment and accessible to the driver's foot sends oil to twenty-three working parts on the chassis. The quart oil reservoir is connected to the various lubricated points by copper tubing and the amount supplied each point is governed by regulators which are proportioned to fit the needs of the various points to be lubricated. The oil is not forced to the location immediately but is held in air domes in the header and allowed to lubricate the part gradually thus giving a continuous supply of oil for some time. This eliminates grease cup and grease or oil gun lubrication.

In general design the frame is much the same as the previous Cleveland but it is  $2\frac{1}{2}$  in. longer. The frame is 6 in. deep and is formed from  $\frac{3}{16}$  in. stock. The front



View of the water pump and generator drives from the top. Longitudinal section of the Cleveland engine



Three of the new body models which are in answer to popular demand

cross member is heavier to take the heavier engine and the second cross member now is eliminated as the bell

door sedan, \$1,495; coupé, \$1,295; five-passenger sedan, \$1,395; touring de luxe, \$1,195; special coupé, \$1,395.

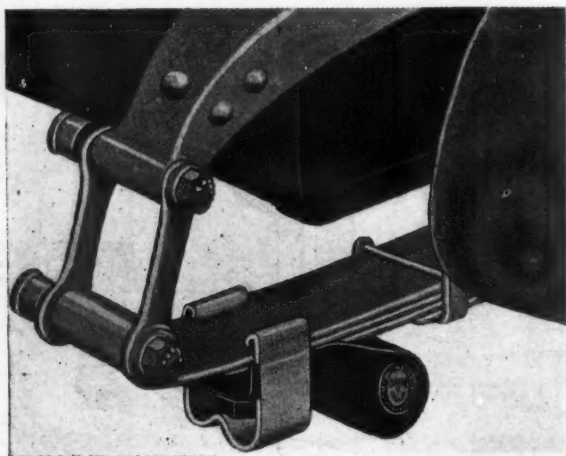
## Harve Stabilizer Employs New Principle to Check Rebound

A SHOCK absorber making use of a new principle has been introduced on the market by the Continental Co., Springfield, Ohio, under the name of the Harve stabilizer. A clip of spring steel is snapped over the chassis spring a short distance inside the spring shackle and the end of a weighted arm is inserted between the clip and the spring.

When the chassis spring is deflected the weight is set in motion in a downward direction and when the deflection of the spring reaches its maximum, the weight, owing to its

inertia, tends to continue its downward course. The end of the arm between the clip and the spring then exerts a sort of toggle action, pressing the master leaf and the leaf next to it firmly together, thereby hindering the sliding motion of the leaves over each other, and, consequently, the rebound. A set screw passes through the arm at the clip.

These stabilizers are made in three sizes, for 1¾ in., 2 and 2½ in. and 2½ in. springs.



Showing the Harve stabilizer applied to the spring

AUTOMOBILE body construction alone in 1923 accounted for a total consumption of 780,000,000 to 800,000,000 ft. of lumber. It is recorded that the lumber required for the body of an open passenger car is 150 ft.; for a small sedan 225 ft., and for a large closed car 325 ft.

It is further estimated that for crating and shipping, both in domestic and export trade, a large amount of lumber is used; probably over 200,000,000 ft. in 1923. Ash is considered a desirable wood because of its moderate weight in proportion to strength, its high degree of toughness, comparative freedom from warping and easy workability. Ash is being used now mostly for the heavier bodies of the higher priced cars.

For body construction the Forest Products Laboratory estimates that 29 per cent of lumber used is maple, 27 per cent is elm, 15.5 per cent is ash, 10 per cent is oak, 8 per cent is gum, 6.5 per cent is birch, 1.4 per cent is softwood pine and hemlock and 2.6 per cent is other species.

housing performs this function. The springs are chrome vanadium steel semi-elliptics with a silico-manganese main leaf in the front spring to form a torque member on account of the added stresses due to the front wheel brakes.

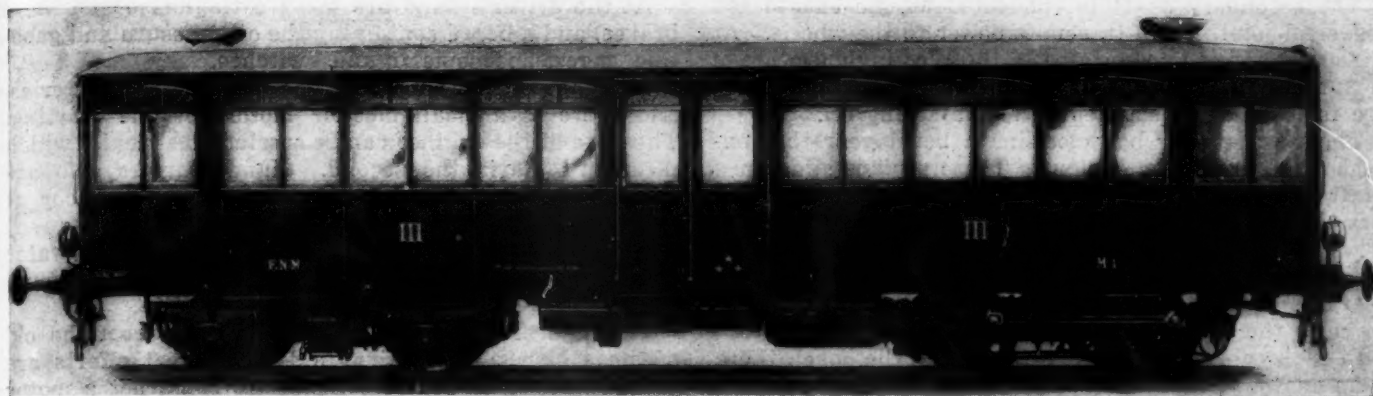
The steering gear ratio is now 10 to 1 instead of 7½ to 1 to counteract the greater resistance of balloon tires. An eccentric bushing also has been added on the worm shaft to take up wear in the gear teeth.

Bodies have been redesigned throughout. They are longer, a high narrow radiator helps to improve the appearance. A raised bead extending from the radiator all around the body of the phaeton accentuates the length. The cowl is rounded and is fitted with a lever type of ventilator. Seats are built well below the upper edge of the body and are upholstered, in the open and coupé models, in genuine leather. In the sedan the upholstery is taupe plush. The instrument board is entirely new and incorporates a balanced arrangement of the glass covered instruments. Open bodies are built by Cleveland and closed bodies by Fisher.

The complete line and prices are:

Five-passenger phaeton, \$1,095; four-door sedan, \$1,495; coupé, \$1,295; five-passenger sedan, \$1,395; touring de luxe, \$1,195; special coupé, \$1,395.





*Railcar with gasoline engines in front and rear compartment recently put in service by the Northern Railway, Milan, Italy*

## Italians Build Railcars to Meet Motor Bus Competition

Fitted with two 60 hp. engines, Westinghouse electrical equipment and air brakes. The gearsets used provide four forward and reverse speeds of which the maximum is 32 m. p. h.

By F. A. Shepley

**D**URING the past few years the high running cost on coal, growth of motor bus traffic and the grave housing shortage have compelled the Northern Railway, Milan, Italy (one of the very few private companies and probably the only one run on sound business lines) to seek a cheaper means of passenger transport than the existing one, more especially for the slack times of the day.

To achieve this, the Società Italiana Ernesto Breda of Milan, according to Engineer Bellini, was entrusted with the construction of six experimental gasoline railcars which have just been put on the lines. It is early yet to say whether the business lost to motor buses will be regained, but the management of the Northern anticipate a reduction in fares which today are a heavy tax on the purse of those who are forced to dwell at any distance from the city.

These new cars weigh, unladen, about 61,600 pounds. Width, roominess and comfort—a startling novelty for third-class traveling here—have been provided.

These cars are built to the following specifications:

Length overall between buffers	50.4 feet
Width	9.68
Entrances	2 central
Internal combustion engines	2
Power developed with gasoline	60 hp.
Power developed with kerosene	50 hp.
Trucks in pairs	Fox type
Speeds developed—1st	2.5—7 m.p.h.
Speeds developed—2d	14 m.p.h.
Speeds developed—3d	22 m.p.h.
Speeds developed—4th	32 m.p.h.
Seating capacity	48
Standing capacity	12
Illumination	Electric
Brakes	Westinghouse and hand
Equipment includes sanders, air compressors, gauges, etc.	

The coaches are mounted on double trucks, only one of which is power driven. The transmission drives one wheel axle, which in turn is coupled by rods to the other axle. Two channel girders constitute the main structure and serve to carry the weight of the motor equipment. Laterally to these are fixed cross brackets, the extremities of which are seated in the longitudinal angle iron girders forming the frame proper.

One of the axles receives the drive from the engines through special inclosed gear. Side rods unite the pair of axles.

### Details of the Engine

Two internal-combustion engines are housed in special cabins at the two extremities of the coach. Here, too, are found the speed change gears, a reverse gear and universal shaft.

Each engine has four cylinders of 120 mm. bore, 180 mm. stroke and runs at 1200 r.p.m. One engine turns to the right and one to the left.

Cylinders are of steel with steel water jackets and are cast separately to facilitate fitting operations and replacements. Cast steel is used for the upper and lower crankcase.

Two pumps provide forced oiling. Oil is drawn by the suction pump from the lower case, and is then passed through a cooler on its way to the reservoir situated in the driver's cabin.

Each cylinder has two spark plugs and each engine two magnetos. The carbureters can be controlled simultaneously by the driver.

A compressed-air control permits either engine to be used at will. The speed change gear has four speeds ranging from 2.5 to 32 m.p.h., with an equal number of reverse speeds.

The secondary shaft is connected at one end to the universal joint, which transmits power to the wheels. At the other end it is connected to the Westinghouse brake compressor, which is fixed to the gearset casing. Gears are inclosed in a cast-steel case containing oil.

The reverse gear box contains a bevel gear that engages with two bevel pinions. These pinions slide on a shaft connected to the universal joint shaft and are so arranged as to engage one side of the bevel gear for forward drive and the other side of the pinion gear for reverse. Between the two is a neutral position. The bevel gear is integral with a pinion that meshes with a gear keyed to the truck axle.

In each cabin situated at each end of the coach there is an engine with suitable control levers. Here also are radiators with suction ventilators to carry off the warm air from the coach and expel it beneath the floor.

At the driver's hand are the Westinghouse and hand brakes, and a board containing the oil pressure and gasoline gages, speedometer and switches.

One engine drives a generator which charges batteries, and there is a small electric motor for the starting. Thus one of the engines can be started electrically which afterward starts the second. Hand starters also are provided. Fuel is stored in a tank under the floor at one side.

Radiators are placed under the seats, and the water used for cooling the motors can be circulated through these.

This railcar marks a distinct departure from the old methods hitherto obtaining in Italy. Great efforts are being made by the same company to construct a motor train that will consume shale oil, which is fairly plentiful in certain parts of Italy.

## American Aircraft Exports for 1923 Were Comparatively Small

THE size of the foreign market for American aircraft is indicated by the 1923 export figures, which show the following shipments last year: Forty-six airplanes and seaplanes, valued at \$308,151; two other aircrafts, valued at \$900; 80 airplane engines, valued at \$65,558; and airplane parts, except engines and tires, to the value of \$58,951. Markets considered in the following article offer almost no opportunities for immediate sales but contain large future potentialities.

There is practically no market for aviation material in Belgium, as Belgium makes its own planes, except for some importation from France.

Modern aircraft development in Soviet Russia, both for government and commercial purposes, is comparatively recent. Since early in 1923 efforts have been made to arouse popular interest and support and the government's attitude toward aviation is decidedly encouraging, but considerable difficulties are apparently experienced in obtaining necessary equipment and personnel. Last year it was estimated that Soviet Russia possessed about 500 military planes in good repair and the government was attempting with only partial success to carry out a program calling for 1150 fighting machines and reserves by January, 1924, and for 2000 fighting machines and 250 reserves by January, 1925. Orders were placed for machines in Germany, England, Italy and Holland, but deliveries were retarded by the fact that money was scarce and credits were not forthcoming.

The market for aircraft and the development of aviation in Mexico has been very limited for with a single exception all aviation activities are in the hands of the Federal Government and under the direct control of the Ministry of War. The Mexican War Department organized a military service in 1915, which has grown to 40 planes capable of flying and 60 other planes which are not in a condition for practical use. No naval aviation or postal services have been established. The only development of commercial flying has been the establishment two years ago in Tampico of a service for carrying pay rolls to the various oil fields in that vicinity, 6 planes of American manufacture being operated.

Due to the prohibition against military and naval air forces in Germany there is no strictly governmental aircraft development at present, although since May 5, 1922, the Germans have been allowed to resume the production of commercial types of aircraft, subject to certain Allied

restrictions and a certain amount of inspection and supervision.

Up to the present there has been very little chance for foreign aircraft competition within German territory, due chiefly to the fact that German aircraft has heretofore been produced, type for type, cheaper, in Germany than would have been possible by any foreign competitor.

## France Cannot Carry Out Motor Fuel Law

FAILURE of the French "carburant national" scheme, designed to render the country independent of foreign sources of motor fuel, is admitted in an article contributed by Colonel Ferrus to the Journal of the Automobile Club of France. Reference has been made repeatedly in these columns to the law compelling importers of petroleum fuels to purchase from the French Government monthly an amount of dehydrated alcohol equal to 10 per cent of their previous month's imports of petroleum. This law went into force on Oct. 1 last, and the importers were to have purchased from the Government during October, November and December a quantity of nominally 100 per cent proof alcohol, equal to 10 per cent of the 180,000 tons of gasoline imported, or roughly six million gallons.

However, the Government itself was not in a position to carry out the law, being unable to supply the petroleum refiners with more than a very limited quantity of absolute alcohol. There has been no lack of denatured alcohol, as the supplies on hand increased by about 18 million gallons in 1923, and the difficulty was entirely in connection with the dehydration, almost water-free alcohol being required to mix with gasoline in the proportion fixed by the law. The whole measure therefore has resulted in a loss.

Col. Ferrus estimates that if attempts to use alcohol as a motor fuel were abandoned it would save the country 100,000,000 francs annually, in addition to which there would be an indirect saving to the amount of 340,000,000 francs, resulting from a decrease in sugar imports of 420,000,000 francs, from which must be deducted 80,000,000 francs representing the value of gasoline that must be imported to make up for the loss in fuel due to the elimination of alcohol.



# Plans Devised to Cut Cost of Handling Lumber for Automobile Bodies

Dry-kiln storage on wheels meets the necessity for rapid turnover of lumber stocks with a minimum of labor.

Location of transfer tracks important.

By B. Nagelvoort and Thomas D. Perry\*

*Plant Engineer, Towson Body Co., Detroit, Mich., and Vice-President and Secretary of the Grand Rapids Veneer Works, respectively*

THE ordinary common board has never received much attention from engineers in the material-handling branches, perhaps because it is not large enough for power appliances, or is too awkward and clumsy for chain or belt conveyors. The time has now come, however, when lumber is of such value and common labor demands such wages that it is necessary to economize in handling expense in order to conserve as much as possible of every board. Hence the necessity for rapid turnover of lumber stocks with a minimum of labor requirement.

Dry-kiln storage on wheels answers this requirement, provided the investment in land and equipment does not exceed reasonable limits. The growing demand for such equipment is rapidly developing standards, both of types and sizes.

Considerable study is required to arrange the laying of rails for such a lumber yard on wheels, with convenient and economical relation to the railroad sidings, the transfer tracks, the dry kilns, the green-and-dry-lumber storage, and the delivering of dry lumber to saws or surfacers.

Rail weights should be from 30 to 40 lb. per yd. A 35-lb. rail, when supported by cement piers every six feet, will carry loaded kiln cars without serious deflection.

Lumber on kiln cars is said to be end piled when the boards are parallel to the rails, and cross piled when at right angles thereto. The direction of piling is usually determined either by the entrance to the wood mill or by the location and shape of the dry kilns.

Loads are normally 16 ft. long by 6 ft. wide for cross piling and 16 ft. long by 8 ft. wide for end piling. While a considerable proportion of ordinary lumber will be less than 16 ft. long, yet this is the standard, and aisles of 2 ft. or more must be allowed between loads when spacing yard rails. The rail spacing for end piling is usually 6 ft. on centers and for cross piling with three rails is 11 ft. outside centers.

The height of loads may extend to 9 ft. above the rails on cross piling and 10 ft. on end piling. Higher loads become unstable and do not dry evenly in the kilns.

The plans shown are actual studies which were prepared recently to meet the requirements of an increased production program in one of the large automobile body plants in Detroit. There was available a parcel of vacant

land 350 ft. by 550 ft. adjacent to the existing buildings, and it was proposed to utilize the ground or grade floor for lumber storage, drying and handling, anticipating the probability that the six-story buildings would later be extended over all or part of the lumber layout.

The daily output required was 50,000 board feet of assorted body stock—ash, maple, elm, poplar and other woods from 1 in. to 4 in. thick. As body stock averages 2 in. in thickness, the drying time was assumed at eight days per inch, or sixteen days for a grand average of all thicknesses. The average for thickness and time had previously been tested out carefully. The daily output multiplied by the drying period gave a necessary holding content of 800,000 board feet of lumber in the dry kilns proper.

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PRESENT day wages and the value of timber have led to careful and efficient plans for moving, drying, storing and sawing the many kinds of wood which go into cars.

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Other obvious assumptions were loading tracks adjacent to the railroad sidings, holding at least one-half of total kiln charge, green-storage tracks having as much more than a complete kiln charge as possible, and dry-storage rooms holding not less than half a kiln charge. In addition it was

necessary to have a heating plant, fuel storage, and a cutting room with a battery of six cut-off saws served by lumber lifts.

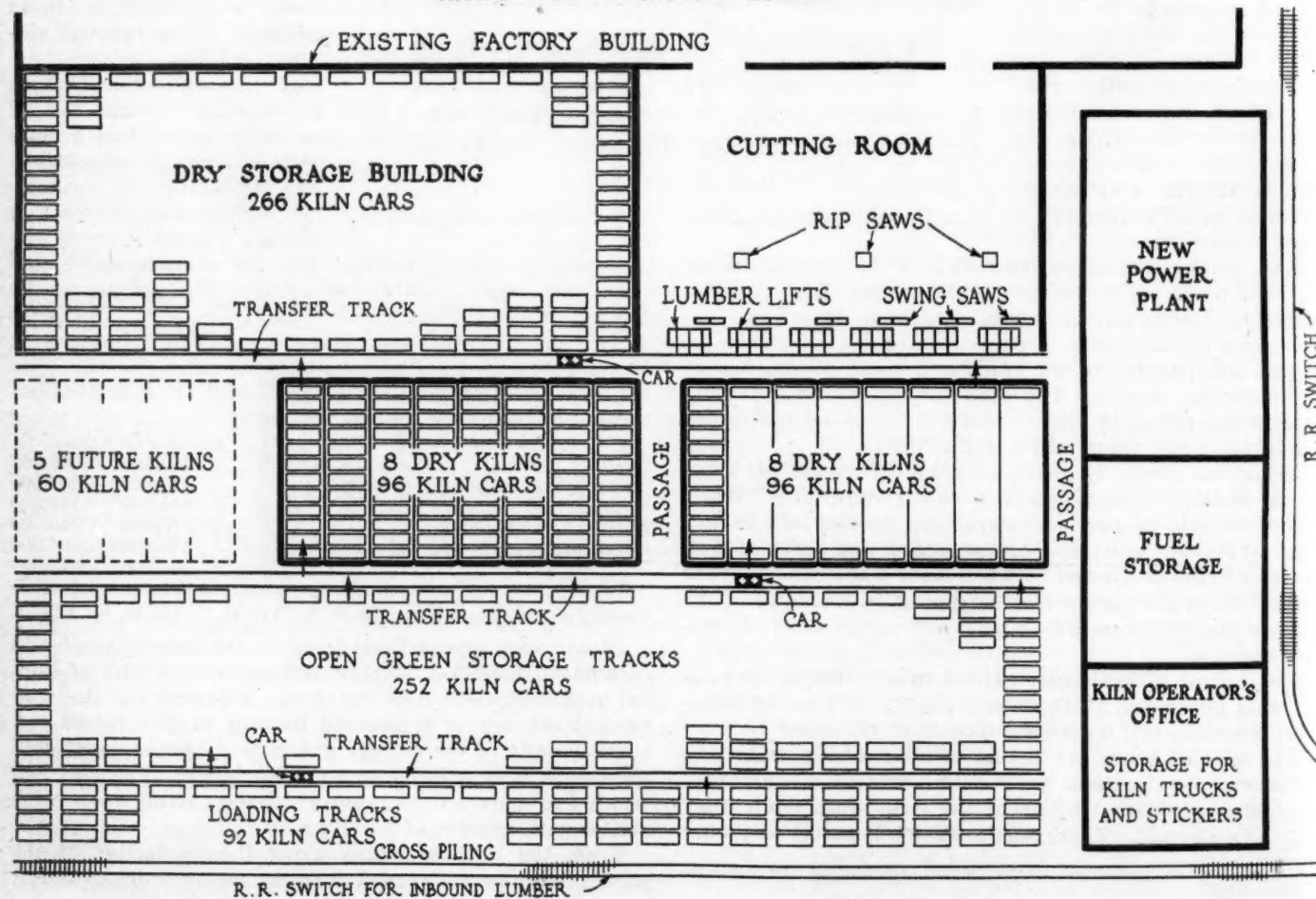
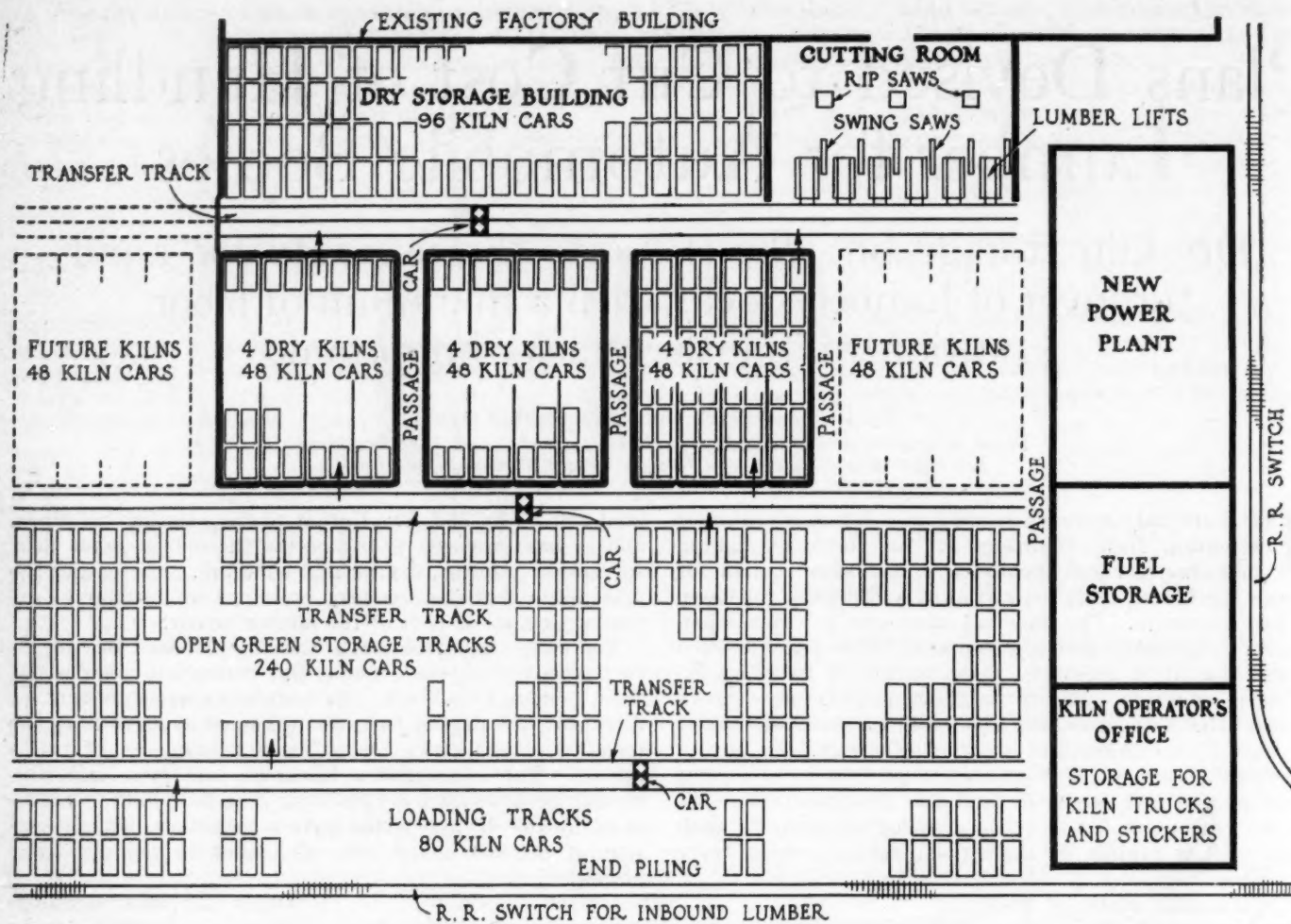
Two arrangements are shown, the end pile based on a kiln car load of 6000 ft. b.m. and the cross pile based on a kiln car load of 4000 ft. Their respective capacities, expressed in board feet, are as follows:

	End Pile	Cross Pile
Loading tracks .....	480,000	368,000
Green storage (before kilning).....	1,440,000	1,008,000
Present kiln capacity .....	864,000	768,000
Future kiln enlargement .....	576,000	240,000
Dry storage .....	576,000	1,064,000
Total .....	3,936,000	3,448,000
Cutting-room dimensions, 70 ft. by 110 ft.	180 ft. by 125 ft.	

Either yard layout lends itself to the very efficient and economical handling, storing, drying, and cutting of lumber and comprises a power house adjacent for the convenient delivery of steam and burning of mill refuse. A careful study of the storage and three transfer tracks will show that it is possible to store lumber by thickness and width and deliver it as required at the cutting room with a minimum amount of handling.

From the railroad siding along the south side of the yard all lumber is loaded directly on to trucks, and it

\*From a paper presented at the Spring Meeting of the A.S.M.E. in Cleveland.





travels on these through the dry kilns to the cutting room with one handling only.

The lumber yard and dry kilns shown constitute the first floor plan of three future six-story buildings 100 ft. by 530 ft. paralleling the railroad track, which will have a wood mill and aluminum bumping department on the second floor and the body-in-white and other departments on the remaining floors.

Details regarding types and capacities of kiln cars and transfer cars are presented later in this discussion.

### Steam Consumption Varies Widely

The steam consumption of batteries of various kinds of dry kilns is not easy to predict, as lumber conditions, climatic variations and operators' practices give three variables that do not readily reduce to averages. It has usually been contended, however, that 0.2 lb. condensation per square foot of radiation per hour is a safe minimum and that a 25 per cent allowance for steam spray is sufficient, making the steam consumption 0.25 lb. per square foot per hour.

Two recent tests in Grand Rapids at the American Seating Co. and the John Widdicomb Furniture Co. give substantial proof that the above allowances are ample.

Table 1—Standard Types and Sizes of Dry-Kiln Trucks  
Wheel

Length, ft.-in.	Width, in.	Height, in.	Diam., in.	Weight, lb.	Kind
20	4 3/4	6 1/4	5	37	End pile, 1 pair wings
20	4 3/4	7 3/4	6 1/2	41	
20	4 3/4	9 1/4	8	48	
4-0	4 3/4	6 1/4	5	58	End pile, 2 pair wings
4-0	4 3/4	7 3/4	6 1/2	62	
4-0	4 3/4	9 1/4	8	68	
5-0	6	7 3/4	6 1/2	64	Cross-pile, without wings
5-0	6	9 1/4	8	70	
5-6	6	7 3/4	6 1/2	67	
5-6	6	9 1/4	8	73	
6-0	6	7 3/4	6 1/2	70	
6-0	6	9 1/4	8	76	

One test ran for 38 days, giving a total condensation of 804,600 lb., or 21,174 lb. daily. The eight kilns contained 9216 sq. ft. of radiation, making the condensation 21,174/(24 × 9216) = 0.096 lb. per sq. ft. per hour. The other test ran for a longer period, resulting in the conclusion that a ten-day drying operation on 1-in. maple required 2500 lb. of steam condensate per 1000 ft. of lumber dried. Each kiln had 1880 sq. ft. of radiation and held 24,000 ft. of 1-in. lumber. The condensation in this case was [(2500 × 24)/(10 × 24)]/1880 = 0.133 lb. per sq. ft. per hour. An average of the two values obtained with 25 per cent added for spray would amount to 0.143 lb. steam consumption per sq. ft. per hour.

### Let Us Take One Instance

Assume an eight-car kiln with 1880 sq. ft. of radiation, holding 32,000 ft. of 2-in. lumber to be dried in 16 days, which is an average automobile body problem. Then, using the unit value just stated, the steam consumption will be

$$1880 \times 0.143 \times 24 = 6452 \text{ lb. steam daily}$$

or

$$\frac{6452 \times 16}{32} = 3226 \text{ lb. steam per 1000 ft. of 2-in. lumber dried.}$$

The usual allowance of 0.25 lb. above would have given

$$\frac{1880 \times 24}{4} = 11,280 \text{ lb. steam daily, or}$$

$$\frac{11,280 \times 16}{32} = 5640 \text{ lb. steam per 1000 ft. of 2 in. lumber dried.}$$

Table 2—Kiln-Car Capacity in Board Feet with Loads 16 Ft. Long

(Based on 6 1/2-in. diam. truck wheels, 2-in. plank base on cross-pile, and 4-in. I-beam girders on end pile.)

Lumber Thickness, in.	Sticker Thickness, in.	Height Above Rail, ft.	Width of Load, ft.	Courses of Lumber	Capacity, ft. B.M.
4/4	1	9	6	50	3200
6/4	1	9	6	40	3840
8/4	1	9	6	33	4220
8/4	2	9	6	25	3200
10/4	2	9	6	22	3520
12/4	2	9	6	20	3840
4/4	1	10	8	54	4470
6/4	1	10	8	43	5480
8/4	1	10	8	36	6120
8/4	2	10	8	27	4590
10/4	2	10	8	24	5090
12/4	2	10	8	22	5610

A safe figure for the powerplant would be a maximum of 5000 lb. of steam per 1000 ft. of lumber dried, and the probable operating basis would be 4000 lb.

The best types are made of structural steel angles or channels and provided with double-flanger malleable iron wheels mounted on roller bearings. The separators and hangers should be welded or riveted, never bolted. Cast iron parts are unnecessarily heavy and break easily under strain, especially wheel flanges.

### Planning for Circulation and Ventilation

The foundation under lumber and on top of trucks should be of 2-in. plank, crown up, on cross-piles, and either 6-in. by 6-in. timbers or 4-in. I-beams on end piles. In order to have plenty of ventilating space in the loads only two-thirds of the horizontal area should be occupied by boards, and the stickers should be equal in thickness to boards. Some allowance should be made for lumber less than 16 ft. long. For practical purposes in body work 4000 ft. is taken as standard capacity on cross pile and 6000 on end pile, both based on a general average of 2-in. thickness.

Standard equipment is usually 10 3/8 in. high so that the yard channels or aisles for these cars need not be inconveniently deep and the kiln operating or control rooms, over which they usually operate, may not be forced too far underground. Successful transfer cars must be sturdy and rigid so that the upper rails may be easily matched for moving kiln cars on and off. Standard sizes and gages are given in Table 3.

There is no excuse for the clumsy process of pushing loaded kiln cars or transfer cars by man power. It is expensive at the present cost of common labor, and exhausting and dangerous from the health and safety standpoint.

The industrial demand has produced a relatively new piece of yard equipment, i.e., an electric or gasoline-driven power transfer car that is not only self-propelling but is supplied with a flexible wire rope and drum and the necessary pulleys or rollers so that kiln cars can be drawn on or pushed off from the transfer car. A combination brake can be provided so that wheels are locked on the track

Table 3—Standard Sizes and Gages of Transfer Cars

	Cross Pile	Medium End Pile	Long End Pile
Length, overall	11 ft. 6 in.	14 ft. 0 in.	18 ft. 0 in.
Width, overall	5 ft. 6 in.	5 ft. 6 in.	7 ft. 6 in.
Height, rail to rail	10 3/8 in.	10 3/8 in.	10 3/8 in.
Gage, inside lower rails	4 ft. 8 1/2 in.	13 ft. 2 1/2 in.	16 ft. 2 1/2 in.
Rail spacing top, centers	5 ft. 6 in.	5 ft. 0 in.	5 ft. 0 in.
Size of channel sides	6 in.	6 in.	6 in.
Diameter wheels, inside flange	10 in.	10 in.	10 in.
Wheels, number of	4	4	4
Weight for shipping, lb.	1000	1250	1650

when operating the drum, or the rope kept taut and the kiln car held in place while the transfer car is traveling. The operator's controls must be reversible and most flexible so that rails can be easily matched and loads not upset. One man, or at most two men, can do twice as much work as six or eight men in the old way.

#### Difficulties Stand in the Way of Using Tractors

A number of attempts have been made to adapt standard tractors to this purpose, but the step down into the transfer alley is awkward, and the attachment of a self-winding drum for wire rope complicates the tractor controls. Pushing or "bunting" the loaded cars around is hazardous, and likely to cramp the wheel flanges on the rails unless the push is applied evenly and steadily.

Lumber lifts is the name that has been applied to what was originally a quadruple jackscrew (four units operated simultaneously by sprocket chains) for lowering a loaded kiln car into a pit until the top of the load was even with the saw table, and maintaining the top of the load at that level until the kiln trucks were emptied of lumber.

These lifts can be entered from either end or side, by either kiln car or transfer car. The lumber lift is not only adapted for use as an unloading device at a saw, but is equally convenient at a surfacer or other machine. It may also be used to lower a kiln car during the process of loading so as to keep the top of the load at a convenient height for workmen, and also to move loaded kiln cars from floor to floor.

Table 4—Capacity and Elevation of Standard Quadruple-Screw Lumber Lifts

(Based on a consolidation of several types and makes, to meet unusual loads and extreme elevations. Size of lumber load, 6 to 8 ft. wide, 16 ft. long, 10 ft. high above rail. Weights given include motor, controller and all metal parts.)

Type	Capacity, tons	Elevation, ft.	Screw Diam., in.	Weight, lb.
Jackscrew....	10	8 or less	3	4200
	8	9	3	4350
	6	10	3	4500
	4	11	3	4750
	20	12 or less	4	7050
	18	13	4	7300
	16	14	4	7550
	14	15	4	7800
	12	16	4	8050
	10	17	4	8300
	8	18	4	8550
	10	10 or less	3	5200
	8	11	3	5300
	6	12	3	5400
Outside screw.	4	13	3	5500
	20	14 or less	4	8300
	18	15	4	8500
	16	16	4	8700
	14	17	4	8950
	12	18	4	9200
	10	19	4	9450
	8	20	4	9700

Hydraulic types of lifts have been successfully used, but some trouble may be encountered in uneven wear on packing unless the loads are most carefully centered and balanced. A loaded kiln car is an unwieldy and awkward unit to raise or lower.

#### Lumber Lifts Do Not Require Counterweights

The usual counterweighted elevators also have been used for similar service, but the lumber lift requires neither counterweights nor safety brakes and operates at slow speed with a minimum of power demand. The lift installation therefore usually costs considerably less than the regular type of elevator for such heavy loads as kiln cars weighing from ten to twenty tons.

There are places in almost every yard where stationary

piled lumber is advisable, and it is often convenient to extend these 16 ft. square piles to a greater height than can be conveniently reached. The stacker or piler answers this requirement and permits piles from 30 to 40 ft. high. Where room is scarce or land valuable, this apparatus will prove useful. Its operation can be reversed for unloading the piles.

There are many other devices that add to the convenience and lower the cost of lumber handling, but enough has been suggested to assist those who have such problems to solve, and to show that the subject is receiving much needed attention on the part of machinery designers and builders, but there are still plenty of opportunities for new and better apparatus with which to handle lumber at reduced costs.

#### Standard Data Book on Brake Linings

THE Asbestos Brake Lining Association is now distributing through its members copies of its new Standard Data Book containing the specifications relating to brake linings and clutch facings. The book is unique in that each member presents the volume as though it were his own individual work, bearing his own cover pages and inside advertising material, but the specifications throughout the entire edition are the same. Through having one printer publish the entire edition, instead of each manufacturer awarding the job to a different printer, the members effected very substantial savings.

The association is not only publishing the books but it also is compiling, revising and issuing the information contained therein. The manufacturers of passenger cars, trucks and tractors will be requested to furnish the data only to A. A. Mowbray, commissioner of the industry, whose office is at 17 West Forty-second Street, New York City. Data in the new edition were compiled by a special committee composed of engineers who are affiliated with the association.

John A. C. Warner, of the Society of Automotive Engineers, is to address the next meeting of the Asbestos Brake Lining Association on the proposed national code for standard methods of testing automobile brakes. The association is continuing to press the National Brake Inspection Movement and special campaigns are being staged weekly in various cities to impress upon the motorists the importance of having their brakes tested at periodic intervals. The brake lining industry reports show that orders are up to expectations this spring.

AN acetylene starter is being made use of for starting up the 400 hp. Lorraine-Dietrich engine used on the Breguet biplane with which Pelletier d'Oisy attempted his 13,000 mile flight from Paris to Tokio. The appliance, which is built by the Viet & Schnibelli Co. of Paris, comprises a one-liter bottle of compressed acetylene gas, a special pump and a distributor.

The pump has two parallel cylinders of equal stroke but different diameters, one of them aspiring pure air and the other taking in acetylene gas, which mixture is delivered into a gas bag. On the return stroke of the pump the mixture, which is rather rich in acetylene gas, so as to give a slow burning explosion, is fed to the engine cylinders through a special type of distributor. The mixture is fired by a hand operated magneto.

Total weight of the appliance is 22 lb., this comprising the acetylene bottle, the pump, distributor and piping. With a one-liter bottle of acetylene the Lorraine-Dietrich engine can be started at least seventy times, and on one occasion, under official tests, provided 105 distinct starts. This appliance has been approved by the French Government Air Service for passenger carrying planes.



# As Others See Us

## Newspapers tell what they think about automobile development as Ford builds his 10,000,000th car

PRODUCTION of the 10,000,000th automobile by the Ford Motor Co. was the signal for widespread editorial comment in the newspapers of the country about the automobile and its place in modern life. The editorial writers in general seem to view the motor vehicle with mingled admiration, amazement, and alarm. Nearly all of them see in its growing use vast opportunities for good and evil, but it is fairly generally agreed that its advantages far outweigh its disadvantages.

Unqualified indorsement of the automobile comes from Arthur Brisbane, who writes in the *Syracuse Telegram* that "it is hard to realize how much going up and down on the earth those ten million cars have meant." "How many ideas, how much fresh air, how much pleasure and increased health do you suppose that mileage represents?" Brisbane asks, and follows with the command, "If you haven't a car, get one."

A record for brevity in summarizing both sides of a case is made by the *New York Tribune*, which races in with the statement that "the automobile has choked our cities, created our suburbs, enlivened our farms, built our roads, covered our landscapes with billboards, popularized golf, incited crime, assisted in salvation, supported a whole populace and cradled a large section of the coming generation. It has had a more profound effect upon us than almost any other of our mechanical inventions, but we are still in a state of considerable vagueness as to what the effect has been." Not an entirely pleasing picture, to be sure, but certainly an interesting one.

The newspapers, along with the automotive industry, are thinking seriously about the traffic problem that has been brought about by the tremendous increase in automobile use in recent years. Few of them see any immediate remedy in sight, but all deplore the increasing complexity of the situation.

### The Problems and the Future

The *Boston Post* expresses this idea when it says that "to the residents of large cities the automobile has brought—along with the pleasure of motoring and easy access to the country, mountain and seaside—traffic problems which are still far from solution." The *Post* continues:

"To the dwellers in the rural districts the motor has brought in a new life by bringing the farm nearer to the city for both social and business purposes.

"Who would venture to say, however, that the motor revolution is anywhere near complete? Since the motor came our cities have grown faster than ever, not because of the motor but in spite of it. Half the population of the country is still crowded in small dots on the map while even within a few miles of the largest cities the great open spaces lie idle and untenanted.

"This is still the problem of the future—to devise a transportation system that will make possible the utilization for homes the beautiful places that are nearby but yet beyond the reach of most of our people."

Possibilities of worse traffic congestion in the future also worries the *New York Telegram*, which says that "if the factories continue busy and the automobiles durable, the outlook for congested roads and streets should be excellent. In time, however, the nation may learn how to cope with the problem presented by this multiplicity of automobiles. Certainly the present situation calls for thought as well as for action."

The rapid growth of motor vehicle use is seen by the *Pittsburgh Sun* as a forerunner of further transportation developments of great moment. "Things certainly do move rapidly in these times," the *Sun* comments. "Who dares stake his reputation as a prophet," it continues, "on the assertion that 25 years hence those of us who are not run over in the meantime will not be flying to our offices or to New York or to San Francisco in our privately owned and operated airplanes and taking it all as a matter of course? Something has got to be done to relieve traffic congestion."

### A Tribute to the People as Well as Ford

Several commentators point to the fact that the quantity consumption of automobiles has been just as remarkable as the quantity production about which so much has been written and said. "The fact that the Ford Motor Co. has been forced into this remarkable speed and quantity production is a tribute not only to the strange genius of Henry Ford but to the enterprise and energy of the American people which have made possible the absorption into service in this country and the greater part of all those 10,000,000 Fords and of over 80 per cent of all the automobiles of all makes now in use," says the *Jersey City Journal*.

The *New York Times* touches on the same idea in an editorial dealing with various phases of automotive development. Concerning quantity consumption it says:

"Henry Ford's name is associated with quantity production. Much less emphasis has been laid on its correlative, quantity consumption.

"It has been a development laden with vast moral and social implications. The dizzying speed of modern life over which people are concerned has here its concrete illustration.

"Educators have regarded with mixed feelings the influence of the automobile on the temperament and world outlook of the young. Business men in other fields of merchandising have deplored the expenditure upon automobile 'luxury' of money that should be going into more homely necessities. Battles have been won with motor trucks and taxicabs. Revolutions have been made with a couple of armored cars.

"But the record is not all on the side of social instability. England defeated at least one serious railroad strike by the use or the threat of the automobile. And it might be argued that social stability has gained by the rise of what may be described almost as a new middle class composed of automobile owners."

# Latin Americans Study Automotive Road Machinery at Work

Methods and equipment for building various types of highways demonstrated for South American Road Congress. Special powerplant equipment needed in the Andes.

By H. E. Everett

**T**HE republics of Central and South America will look to the United States for the bulk of their road building and maintenance equipment, especially such equipment as is automotive. This was evident from the expressions of many of the delegates who attended the Pan-American road congress tour through North Carolina last week, which included one entire day, Friday, June 6, at the road show staged by the American Road Builders' Association in Greensboro, N. C.

Their attendance at the show revealed that the Latin Americans are fully as interested in the equipment for building and maintaining roads as they are in the various types of construction which they are studying during their tour. But while the United States is expected to become the chief source of supply of road equipment, the equipment will have to be adapted to meet varying conditions in the South American countries.

## Roads at an Altitude of Two Miles

As one illustration, Ecuador is now constructing new highways in the Andes. In many places the roads are at altitudes as high as 12,000 ft. Large numbers of heavy duty trucks are needed for their work. The altitude necessitates a special carburetor. The water supply at this altitude is plentiful but the water contains many impurities which deposit sediment in radiators, clogging the cooling system. In the opinion of the Ecuadorean members of the delegation a tube radiator is necessary with top and bottom places which can be removed at frequent intervals for cleaning. Also on account of the condition of the water and the fact that distillation of water is impossible because of the low boiling point at that altitude, the use of storage batteries is considered impractical and the electrical current must be developed direct from a magneto.

A limited number of tractors will be used on this work, and the same adaptations to fit the conditions of high altitude will be required. One company exhibiting heavy duty trucks was interested sufficiently to promise to conduct some experimental work at high altitudes in the United States in an effort to meet this condition.

In some of the more central South American republics, especially those located more to the interior of the continent, there is considerable interest in automotive equipment, but little expectancy that it will be generally adopted. High prices for fuel together with cheap horses and cheap labor will doubtless prevent the adoption of much mechanical equipment. The delegates from these countries, however, were interested in shovels and other excavating and loading equipment, but seemed to think that steam would be a more economical power than internal combustion engines.

Delegates from Cuba expressed some surprise that no equipment was shown for burning alcohol which is extensively used in the island republic, being economically obtained from sugar mill refuse. However, they were much interested in gasoline equipment as well, and were interested in small tractors and trucks and the lighter power and transportation units. Cuba is now building a road extending the entire length of the island and it was freely predicted by the Cuban delegates that much of the work would be done with American automotive equipment. Many of the supply houses in the island are prepared to install alcohol equipment on American machines.

One thing which the Latin Americans impressed upon the American was the necessity for expert and complete repair service. They were keenly interested in the manufacturers' South American distribution arrangements, and the accessibility of all kinds of service. It will require much time to introduce new equipment and to educate the average South American to operate and maintain it properly. Transportation is slower than in the United States, which increases the necessity for adequate repair service. Many of the highways will be built through sections into the interior where rail transportation is lacking. Manufacturers expecting to do business in these countries accordingly must make ample provision for service.

## Rapidity of Construction Is a Factor

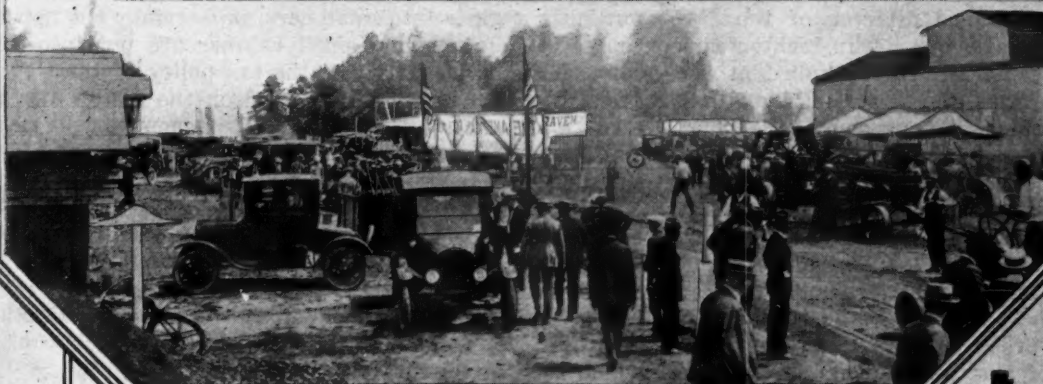
During their stay in North Carolina the Latin-Americans witnessed several road projects in process of construction in North Carolina's \$80,000,000 road building program. They were intensely interested in the hard surface work, interested not so much from the fact that South America will build a large mileage of this type, but more from the standpoint of equipment and rapidity of construction. However, it was evident from the questions asked and the greater interest shown, that the building and maintenance of dirt roads is the biggest problem of the southern continent. Graders and rollers were of particular interest to them, and most of them were agreeably surprised at the low cost of doing work with American equipment. Much interest was shown by both the foreign delegates and highway officials of many American states in the great variety of work done by Fordson tractors and the manner in which it has been adapted as a self-contained power unit for almost every kind of road machinery.

American manufacturers are not likely to experience any immediate results from the Greensboro show nor from the road inspection trip which will consume several weeks and extend into ten different states. The delegates frankly admit that they are not on a buying tour, but merely here to study types, methods and equipment. South American

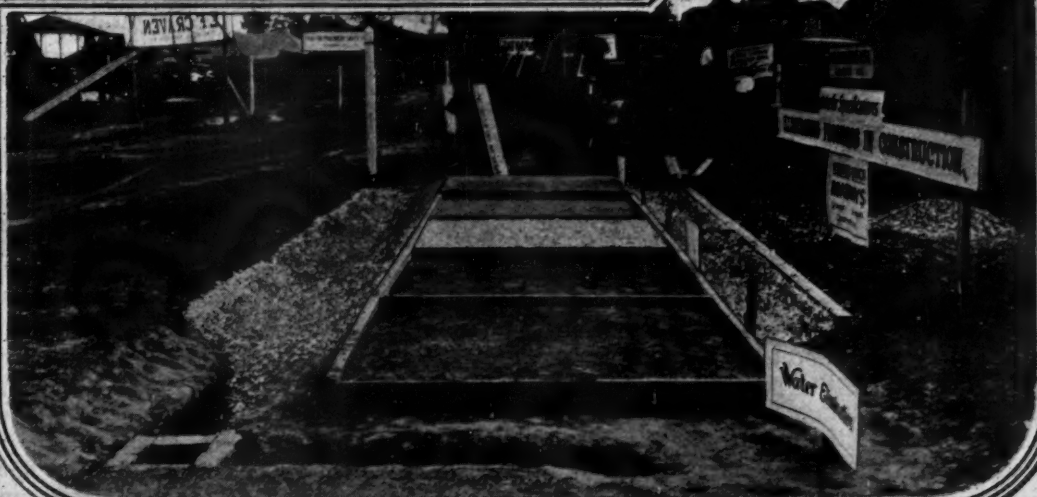




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- (1) The train of motor coaches which carried the Pan-American Road Congress.
- (2) "On the lot" for the demonstration of road-building machines.
- (3) The progressive steps of road building visualized for the delegates.
- (4) A stretch of the North Carolina \$80,000,000 project in the making.

countries are experiencing a greatly awakened interest in better roads. The representatives are taking copious notes, in fact are seldom seen without a note book. Nearly all of them are carrying cameras and recording their own impressions as they go along. When interested in any equipment they leave their cards with the request that catalogs be sent them. They expect to be back in their respective countries in sufficient time to digest the manufacturers' literature, and to place orders for such equipment as they will want in sufficient time for the start of their road building season in November and December.

The general impression one gains from the Latin-Americans is that they feel that their more primitive construction methods are unequal to the task of building the highways that will be constructed during the next few years; and that more modern, less expensive and more rapid production methods will have to be employed. The transition from the old to the new, however, will necessarily be gradual as it will require time to acquaint contractors with American equipments and to train them in operation and care of American automotive road building and maintenance equipment.

## Economic Difficulties Hinder German Automotive Industries

**A**MONG the representatives of the German automobile industry who took part in the recent world's automobile congress in Detroit and visited a number of our factories was Oskar Knoop, technical director of the Nationale Automobil Gesellschaft of Berlin-Lichterfelde. Upon his return to New York Mr. Knoop called at the office of AUTOMOTIVE INDUSTRIES and was kind enough to give us some of his impressions of our own industry as well as of conditions in Germany.

As an old machine-tool man, Mr. Knoop expressed the opinion that no other industry had developed manufacturing methods to quite the same extent as the automobile industry. Problems have been solved which were not dreamed of in mechanical manufacture previously.

Business conditions in the automobile industry in Germany are very bad at the present time. Last year there was a continuous series of ups and downs, due to the irregular changes in the exchange value of the mark. Sometimes orders came in very freely and at other times they would stop suddenly. In addition the industry had great difficulty in securing the necessary raw materials, especially since the occupation of the Ruhr District, something over a year ago.

At the present time the greatest difficulty is due to a scarcity of capital, which has made it impossible for many works to operate to their full capacity. For this same reason it is at present impossible for German automobile manufacturers to equip themselves along the lines the larger American factories are equipped.

It is Mr. Knoop's opinion that no great increase in automobile sales can be expected in Germany during the next few years, because the people have been too much impoverished. One thing that deters people from buying automobiles is that the operating costs are too high. Not only are fuel prices about twice as high as in the United States, but the tax burdens on motorists, as well as on the industry, are very onerous.

### Taxes Heavy

Automobiles are subject to a 15 per cent luxury tax, and the annual registration fees or taxes amount to as much as 10 per cent of the first cost of the car.

There is a sales tax of 2½ per cent on all commodities, which must be paid every time raw material, half-finished and finished products change hands, hence this tax is paid several times before the car is finally placed in service by the private owner. A very high tax is levied on coal, and besides there are innumerable so-called "social" taxes, such as that to defray the expenses of the workman's accident indemnity, sickness relief and age pension system. Mr. Knoop figures that about 40 per cent of the sales price of an automobile is represented by taxes.

As regards automobile engineering in America, Mr.

Knoop expressed the opinion that it had reached a very high state. In Germany they pursued a somewhat different course of development. Whereas it is the practice here to put large engines into small cars, in Germany the opposite course is followed, and small engines are put into large cars. This is due partly to the tax policy of the Government, the annual tax being based on the piston displacement, and partly to the demand for economy in operation. This latter factor also compels the use of comparatively small engines in trucks.

Balloon tires have not been extensively used in Germany, but their manufacture has been taken up by the Continental Tire Company. They undoubtedly are a big factor in improving the riding qualities of cars. Some people consider them excellent nail collectors and others hold that they make a car sluggish in starting, but on the whole they are favorably regarded.

Four-wheel brakes, in Mr. Knoop's opinion, are a very desirable feature, for the double reason that they permit of greater average speeds on congested or obstructed roads and that they add to the safety of automobile travel. Another thing in their favor is that they do away with the transmission brake as a stopping brake, which latter is objectionable because it subjects the propeller shaft and rear axle shafts to great strains, which strains do not occur in the case of rear-wheel or four-wheel brakes. Four-wheel brakes will become an absolute necessity in the future.

**O**UT of an estimated national wealth for the United States in 1922 of \$320,803,862,000, the motor industry accounted for a total of \$4,567,407,000, or 1.4 per cent of the whole, according to figures just released by the Bureau of Census. Point is made that no comparison can be made in the figures with former years, inasmuch as when the last estimate was made in 1912 the motor industry did not figure.

Explanation is made that the estimates for motor vehicles are based on reported production during a period of years covering the average life of automobiles, trucks, tractors and motorcycles and statistics of registration prepared by the Bureau of Public Roads and other agencies, with allowances for depreciation, and valuation in accordance with prices prevailing in 1922.

Street railway systems, according to the statistics, outrank the motor industry by one-tenth of 1 per cent, they being credited with 1.5 per cent of the whole. Coincidentally the wealth of the nation in gold and silver coin and bullion is also 1.4 per cent of the whole, or exactly the same as the motor industry.

Real property and its improvements, taxed, the statistics further relate, form 48 per cent of the whole, or approximately one-half.



# Supercharger Permits Use of Smaller Engines With Surplus Power

Experience gained with airplane and racing engines shows that the supercharger can be used to increase the speed at which horsepower curve peaks.

By P. M. Heldt

**I**N view of the fact that two of the racing classics of the year—the Targa Florio and the Indianapolis 500 mile race—were won by cars fitted with superchargers, and of the old (and somewhat time-worn) rule that “the racing cars of today are the stock of tomorrow,” there naturally is an interest in superchargers and the role they may be expected to play in the passenger car field in the future.

Superchargers permit an increase in the maximum power output that can be obtained from an engine of given displacement, and therefore, permit the use of an engine of smaller displacement on a car of given weight for given performance characteristics. In many localities the registration fees or annual taxes are more or less proportional to the engine displacement, and the use of the supercharger therefore would permit of cutting down the tax, at least until the practice became somewhat common, in which case the lawmakers undoubtedly would take note of it and establish a differential against supercharged cars.

Assuming that the supercharger is in operation only on the somewhat rare occasions when a great deal of power is required, the smaller engine would ordinarily be operated at a higher load factor than the larger one, and this would ensure for it a somewhat higher mean thermal efficiency. In other words, with the smaller engine, the miles per gallon would be somewhat greater.

Supercharging means forcing into the engine cylinders a quantity of charge greater than can be drawn in by the mere displacement of the pistons under similar conditions of speed and atmospheric density. It is a very old idea which probably was suggested and tried out even before application to automobiles made it desirable to get the greatest possible power from internal combustion cylinders of given dimensions.

## Idea Grew Out of Aircraft Problem

During the war the idea of compensating for the natural decrease in power output of aircraft engines with increase in altitude suggested itself, and a great deal of research work and experimentation was done by all the leading belligerents. At an altitude of 18,000 ft. an ordinary aircraft engine develops only about one half as much power as at ground level. This decrease in engine power with increase in altitude limits the maximum height that may be attained by the plane, and as in aerial encounters the machine which has the highest ceiling has a great advantage over its adversary, the importance of supercharging is obvious.

Air can be forced into the cylinders only by means of a pump, and of the different types of pump known—plunger, rotary piston and centrifugal—only the latter

type has been used on aircraft engines so far. Two methods of driving have been developed. Rateau in France and Moss in this country drive the centrifugal pump or blower by means of a turbine operated by the exhaust gases from the engine, while others, and particularly a number of German firms, use a direct mechanical drive from the engine.

Both methods of drive involve rather serious difficulties. With the exhaust turbine drive the weakening of the impeller blades by the high temperature to which they are exposed, combined with the high stresses to which they are subjected by the centrifugal force, calls for the most careful selection of material and the most rational proportioning of the blades or vanes. With a turbine drive there is also a back pressure on the exhaust, which has a tendency to reduce the engine output, and unless the apparatus is properly designed the net output may be decreased instead of being increased.

## Production Reached at Time of Armistice

At the time of the Armistice the supercharger had just about reached the production stage, and it had been found possible to maintain the power of aircraft engines constant from the ground to an altitude of about 20,000 ft. As to this altitude the density of the atmosphere is slightly less than one-half that at ground level, it is evident that it had been found practical to slightly more than double the density of the charge by means of the supercharger.

In an automobile engine, which is used at ground level only, the object of the supercharger is naturally somewhat different. The density of the atmosphere from which the cylinders draw their supply of air remains substantially constant, but owing to the wire-drawing which takes place in different parts of the inlet tract, and especially at the valves, the cylinders are never filled to atmospheric pressure.

With any particular engine the under-pressure or degree of vacuum in the cylinders at the end of the inlet period increases with the speed. In other words, the higher the speed the less combustible charge the engine will draw in per cycle, and as the energy content is directly proportional to the amount of charge the result is that the torque of the engine falls off as the speed increases.

Even at the lowest speed of stable operation under full throttle the engine does not receive a full charge, that is, a charge equal in volume to the piston displacement at atmospheric pressure. Ninety per cent of the theoretical full charge is about the best that can be got into the cylinders even under the most favorable conditions, and when the engine approaches its speed of maximum output the volumetric efficiency drops to about 70 per cent.

Of course, by enlarging the valves and other parts of the inlet tract we can improve the volumetric efficiency at a given speed, and thus increases the speed of maximum output. The power output is proportional to the product of the speed and the torque and therefore is a maximum when this product is a maximum. This is the case when the torque decreases in the inverse ratio as the speed increases. For instance, if in passing from a speed of 2000 to 2100 r.p.m. the torque decreases in the ratio of 21/20 then the maximum power output corresponds to a speed of about 2050 r.p.m.

With present day fuel we are limited to a compression of about 85 lb. per sq. in. gage, and even this compression can be used only in cylinders of comparatively small bore and with careful design of the water jacket. Most engines are designed to work at just below their maximum permissible compression when running at comparatively low speed, and at these speeds they would not stand any supercharging.

### Lowering the Expansion Ratio

In the past, engines have been built occasionally with an oversized compression space, so that with normal atmospheric induction the compression would be only 40 or 45 lbs. per sq. in., the compression then being brought up to normal by forcing an extra amount of charge into the cylinders. It is true that in this way the power output from an engine of given displacement can be increased, but this scheme of operation results in low fuel economy. We are in the habit of saying that the thermal efficiency or an internal combustion engine depends upon its compression ratio, but what we really mean when we make this statement is that the efficiency depends upon the ratio of expansion of the gases during the power stroke, which in the ordinary Otto engine happens to be the same as the ratio of compression. On the other hand, if we force an extra charge into the cylinders by means of a supercharger, then the ratios of compression and expansion are no longer the same.

For instance, let us assume an engine cylinder in which the compression chamber volume is equal to one-third the piston displacement and therefore to one-fourth the volume of the combustion chamber at the beginning of the compression stroke. In this case our compression and expansion ratios are both 4 to 1. Now let us double the compression space and by means of some supercharging device force in twice the amount of charge, so that at the end of the compression stroke the compression will be exactly the same as previously. The compression volume is now equal to two units and the total volume at the end of the expansion stroke is five units, hence the expansion ratio is now only five to two or 2.5 to one.

### Exhaust Loss Increased

The result is that at the moment the exhaust valve opens the pressure and temperature of the gases are still much higher than they are at the corresponding point of the cycle in the cylinder with four to one expansion and a much greater proportion of the heat energy is lost with the exhaust. At the present time, when so much emphasis is laid on the importance of fuel economy, this method of operation is entirely out of the question. Aside from its wastefulness it is subject to the objections that—the exhaust pressure being much higher—it is much harder to muffle such an engine effectively and the heat stresses on the exhaust valves are greater.

As far as the use of superchargers on racing engines is concerned, if the piston displacement is limited and there is nothing in the rules and regulations to exclude them, the advantage is obvious. Even the additional fuel

consumption resulting from forcing more than the theoretical full charge into the cylinders and enlarging the compression space to prevent detonation with this increased charge, is warranted, and to judge by the comparatively sharp exhaust noises characteristic of racing cars with superchargers, this method of operation is actually employed.

The only advantage offered by the supercharger for stock passenger car engines is that it permits of increasing the output from an engine of given cylinder dimensions and, inversely, permits of the use of an engine of smaller cylinder dimensions for the same car performance, which results in weight reduction and economy.

It was stated in the foregoing that the ordinary engine at its speed of maximum horse power output draws in only about 70 per cent of a full charge per cycle. Let us assume that this speed is 2500 r.p.m. It would not be difficult by means of a centrifugal or some other kind of blower to bring the charge at this speed up to 100 per cent of its theoretical value and thus increase the power output about 43 per cent. The net gain in power, of course, would be smaller, because a portion of the extra power would be needed for driving the supercharger. If the engine is built to be able to stand a higher speed of operation, the power can be further increased, because with the supercharger the output will continue to increase beyond the speed at which it attains its maximum value without this device.

### Here Are Two Advantages

There are two advantages in using an engine of small displacement, and both of these are much more important in most European countries than they are here. The first is that the annual taxes or registration fees are generally based either on the total piston displacement or on the cylinder bore and the number of cylinders, hence with the engine of smaller displacement (which the supercharger permits of using) the tax will be lower. This is a rather small consideration in the United States, but in England, where the annual tax on a Ford is in the neighborhood of \$100, it is a matter of considerable moment.

Secondly, the smaller displacement engine when operating without the supercharger gives a somewhat higher fuel economy, as compared with a larger engine delivering the same horsepower. To get an idea of the magnitude of this economy factor it is necessary to determine approximately the ratio in which the power output could be increased by means of the supercharger.

In racing engines, from which the designer endeavors to obtain the very utmost in power whether using a supercharger or not, it seems that the possible gain is not very great. For instance, the Sunbeam 1923 122 cu. in. racing engine was said to develop 108 hp., whereas the Fiat engine of the same displacement with supercharger developed 118. It was estimated that 10 hp. was required to drive the supercharger, hence the extra power developed in the engine amounted to some 20 hp.

Considerable data as to the power required for driving superchargers for large aircraft engines are available, but it is somewhat difficult to apply this to the case of the stock car supercharger. It is quite possible, however, to calculate the power required approximately on the basis of fundamental principles.

### Take an Example

Let us assume an engine of 183 cu. in. displacement which is to be run at 2500 r.p.m. and at that speed is to pass an amount of air equal to its full theoretical displacement. The total piston displacement will be generated during intake strokes once during every two crank-



shaft revolutions, hence the air displacement per minute will be

$$1250 \times 183/1728 = 132 \text{ cu. ft.}$$

It was stated in the foregoing that the volumetric efficiency at this speed might be expected to be about 70 per cent, hence, in order to get atmospheric pressure in the cylinders at the end of the inlet stroke the cylinders must draw from a source where the pressure is

$$14.7/0.7 = 21 \text{ lbs. p. sq. in.}$$

By now applying the well known formula for the work required for the adiabatic compression of air, viz.,

$$W = 3.463 p_1 v_1 [(p_2/p_1)^{0.28} - 1],$$

in which  $p_1$  and  $p_2$  must be inserted in pounds per square foot and  $v_1$  in cubic feet per minute, we get the work done in foot-pounds per minute, which if divided by 33,000 gives the horsepower required. The result in this case is 3.22. This is the output of the blower, and as the efficiency of this device is not likely to be greater than 50 per cent, the actual power required to drive it would be twice this, or 6.44 hp.

As regards the efficiency of 50 per cent, this corresponds closely with results obtained by Rateau, who uses a centrifugal blower and an exhaust turbine to drive it and finds that the efficiency of the combination is about 25 per cent, which would make the efficiency of each device 50 per cent if the two efficiencies were equal. Rateau's experience was with a combination for a 300 hp. aircraft engine, and for the smaller compressor required for the stock car engine the efficiency could not be expected to be greater.

#### Power Required for Supercharging

With the 6.44 hp. we would force 132 cu. ft. of air into the engine per minute, which we have assumed to be  $0.3 \times 132 = 39.5$  cu. ft. more than we could get in in the usual way. Under favorable conditions the air consumption in an engine is at the rate of 2 cu. ft. per horsepower per minute; hence the additional 39.5 cu. ft. of air should add  $39.5/2 = 19.75$  hp. to the output of the engine, and if we subtract from this the 6.44 hp. required to drive the blower we have a net gain of 13.33 hp. without any increase in engine speed. With increase in speed this gain could be further augmented.

Although for aircraft work only the centrifugal type of blower has been used, it is not sure whether this would be the most suitable for stock car work. The centrifugal blower, of course, is the simplest type, but exceedingly high blade tip speeds are required and the stresses in the material of the blades due to centrifugal force therefore are enormous. Rateau, for instance, figures that the centrifugal force on any particle of the material at the tips of his impeller blades is 123,000 times the weight of this particle. He uses a single impeller of 10 in. diameter which turns at 30,000 r.p.m. In order to reduce this centrifugal force the Germans use three or four step blowers or compressors, which permits them to cut down the blade tip speed to about 500 ft.p.s. (as compared with the 1250 ft.p.s. used by Rateau). The impellers of these aircraft superchargers are usually made from a solid block of chrome-nickel steel, the blades being given a section which insures substantially uniform stress throughout. This is a practice which would hardly be followed in connection with superchargers for stock engines, on account of the high cost of production.

#### Piston Pump Superchargers

Piston pumps can be used for supercharging, and these can be combined with the engine itself so as to require practically no extra parts. For instance, if the crankcase is divided into as many airtight compartments as there

are crank throws, each compartment will act as an air pump, and as there are always two compartments compressing air to one cylinder drawing in a charge, the pumping displacement is twice the cylinder displacement and the cylinder charge can be materially increased by passing it through the crank chamber.

This system has been actually applied, but not reduced to a commercial basis. As the crank chamber pump would act at all engine speeds, it would evidently be necessary, in order to prevent detonation at low speeds, to increase the compression chamber volume over what it would be made without the supercharger, which would result in a reduction of the expansion ratio and of the thermal efficiency, as explained in the foregoing. Aside from this, the division of the crank chamber into a number of airtight compartments and the provision of passages from each crank chamber compartment to two inlet valve pockets would add materially to the weight and complication of the engine.

#### Ricardo's Experiments

In England Harry Ricardo did some development work in the way of supercharging during the years 1915 and 1916. He used what he calls a crosshead chamber for forcing additional charge into the cylinder. This is an annular space at the bottom of and concentric with the working cylinder, in which pure air is compressed during the inlet stroke of the particular piston, to a pressure of 12 lb. p. sq. in. gage. During the inlet stroke combustible charge is drawn into the working cylinder in the usual manner, and when the piston reaches the end of this stroke it uncovers a series of transfer ports between the crosshead chamber and the working cylinder, whereby the pressures in the two chambers are equalized, with the result that pure air passes from the crosshead chamber to the working cylinder, filling the lower part of the combustion chamber and increasing the pressure in the latter to 5 lb. p. sq. in. above atmospheric.

In this engine charge stratification is combined with supercharging. An engine of 600 nominal horsepower was designed and built, and is said to have developed 700 hp. on tests, but it developed weaknesses in the crankcase and, as Ricardo about this time had to take up new duties in connection with the development of tank engines, the design was never developed further.

Another type of blower which can be used for supercharging is that known as the positive rotary blower, which corresponds in principle to the gear pump. With such a blower it is not necessary to go to such high peripheral speeds as with the centrifugal blower, but, on the other hand, it undoubtedly involves greater frictional losses.

#### Centrifugal Stresses

Another problem that arises in connection with centrifugal blowers, and to a lesser extent also with other types, is that, due to the great inertia of the moving masses and the consequent shocks to the driving mechanism in case of any irregularities in the drive. A great deal of trouble was experienced from this cause in connection with superchargers on aircraft engines. Although the revolving parts are made as light as possible, with peripheral speeds of from 500 to 1250 ft. p. s., the energy stored up is enormous and, if the drive is through gearing, it is necessary that the teeth be cut with the greatest accuracy. It is also desirable that an elastic member be incorporated in the drive.

The Germans made some experiments on the variations in driving torque due to irregularities in the speed of the power source by inserting a flexible coupling in the drive and providing same with a scribe which would register the relative angular motion of the driving and driven

members of the coupling. They found that the driving torque occasionally attained four times its average value.

### Inter-cooler Used

One accessory that is being used in connection with superchargers on aircraft engines but which probably would not be considered essential on passenger car engines is an inter-cooler. When air is compressed its temperature increases, and as the volumetric efficiency of an engine is decreased by heating of the incoming charge or of the air, and high output is so important in aircraft work, it was found desirable to cool the air during its passage from the blower to the engine cylinders.

### Temperature Rise of Air in Supercharger

For passenger car engines there is less need for cooling the air, for one reason because the ratio of air compression, and therefore the temperature increase is lower than in aircraft work. Assuming the air when entering the blower to be at 60 deg. Fahr. (= 521 deg. abs.), and that it is compressed from 14.7 to 21 lb. p. sq. in. pressure, the temperature of the air at delivery can be found by means of the equation

$$\frac{t^y}{p^{y-1}} = \text{constant.}$$

Designating the initial pressure and temperature by  $p$  and  $t$  and the final pressure and temperature by  $p_1$  and  $t_1$ , we have

$$\frac{t^y}{p^{y-1}} = \frac{t_1^y}{p_1^{y-1}}$$

If the compression were truly adiabatic the value of  $y$  would be 1.408, but there is necessarily some heat loss through the walls during compression and actually  $y$  therefore will be smaller—probably about 1.35. We may then write

$$\frac{521^{1.35}}{14.7^{0.35}} = \frac{t_1^{1.35}}{21^{0.35}}$$

$$t_1^{1.35} = \frac{4652 \times 2.902}{2.562} = 5265.$$

$$t_1 = 575 \text{ deg. abs.} = 114 \text{ deg. Fahr.}$$

There would therefore be a rise of 54 deg. Fahr. in the supercharger, which is certainly not more than the temperature rise of the charge due to the usual hot air stoves, hotspots, etc.

### Carburetor Location

It is evidently possible to place the carburetor either ahead of the supercharger or between it and the engine. Placing it ahead of the supercharger has the disadvantage that the latter then contains an explosive charge which in case of a backfire from the engine would give rise to an explosion of very considerable force. Otherwise this arrangement is the simplest, as both the carburetor intake and the float chamber are subjected to atmospheric pressure and the problem of insuring constancy of mixture proportion is exactly the same as with an ordinary engine. Further, the float chamber being under atmospheric pressure, the ordinary vacuum fuel feed can be used.

Considerations of safety seem to have turned the decision in practically all cases in favor of the location between the engine and supercharger, however. In that case it is necessary to insert a pressure equalizing tube between the carburetor air inlet and the float chamber, and the float chamber must otherwise be rendered airtight. The float chamber is then maintained at a pressure higher than atmospheric and the fuel will not run into it by gravity but must be forced in by pressure.

Although the medium handled by the supercharger with

this latter arrangement is supposedly pure air, provisions must be made to take care of possible explosions in the connecting passage from the delivery outlet of the supercharger to the carburetor. This can be done by providing the latter with one or more spring-pressed valves, opening under an inside pressure exceeding a certain value. Care must also be taken to prevent any gasoline that may leak from the spray nozzle or accumulate on the carburetor mixing chamber walls and run down them, from accumulating in the air chamber between the supercharger and carburetor. This can be done by providing the carburetor underneath the nozzle with a drain pocket with a small drain hole at its lowest point. There will ordinarily be some air leakage through this drain hole, but this is negligible.

From the above it will be gathered that by means of a supercharger it is possible to materially increase the maximum output from an engine of given displacement—probably by as much as 50 per cent. The advantages accruing from this increase in power, then, must be compared with those resulting from the use of an engine of larger displacement.

### Drive Through Friction Clutch

Undoubtedly the supercharger engine could be built somewhat lighter. It is understood that the supercharger would be connected only when power in excess of that of which the engine is capable without it is demanded, and when running without supercharger the smaller engine would be somewhat more efficient than the larger one because its load factor would be larger.

Owing to the fact that motor fuel costs from twice to three times as much and annual taxes are up to ten times as high in Europe as here, European engineers should be interested in superchargers much more than we. In this country under present conditions the value of the supercharger on private passenger cars is problematical and at best only very slight.

It is different in the case of racing cars, where the addition of a mile per hour may be the difference between success and failure. If the supercharger permits the racing car designer to increase the speed of his machine from, say, 99 to 100 m.p.h., it has justified itself, but such a speed increase is of no value under ordinary operating conditions.

## Proposes to Turn Historic Canal Into Sunken Roadway

A BILL just proposed before the English Parliament provides for the draining of Regent's Canal and converting it into a sunken road for motor freight traffic. The canal, completed in 1820, extends from the Thames at Limehouse Basin to the Grand Junction Canal at Paddington, and before the advent of railways carried an enormous tonnage. It is 8½ miles long, 60 ft. wide, and 12 ft. deep.

The plan is to revet the sides, pave the bottom, and have two 20-ft. roadways through the center for through traffic, and a 10-ft. space on each side for loading and discharging vehicles. Water, electricity and sewage would be carried below the roadway.

The Thames end is in the center of the dock system on the north side of the river and is within 500 yd. of the Rotherhithe Vehicular Tunnel, which crosses under the river to the great Surrey Commercial Docks on the south side, and the canal passes near all the great railway freight terminals north of the Thames except the Liverpool Street Station of the present London & North-eastern Railway.



# Crane Built on Motor Truck to Handle Heavy Freight

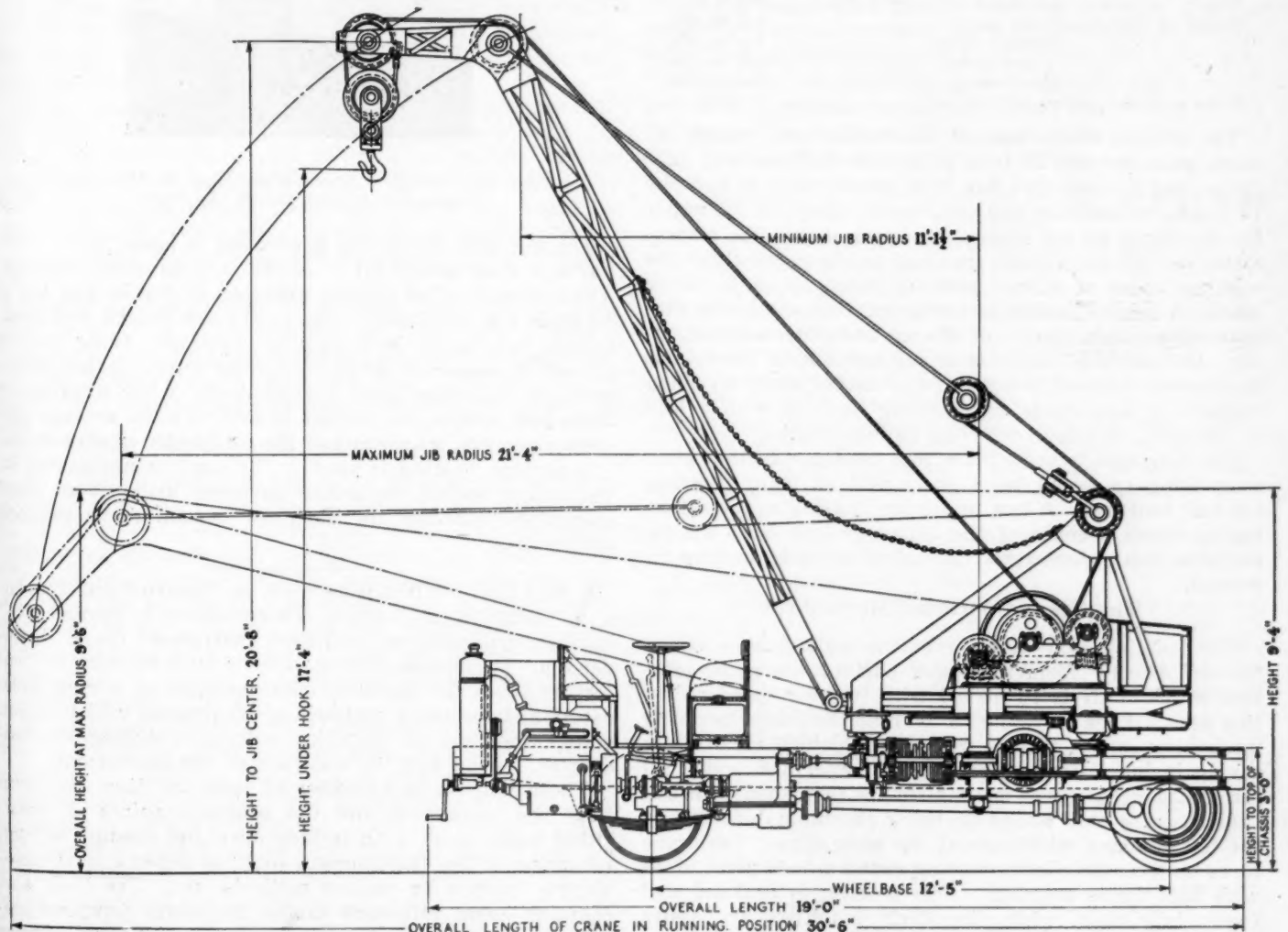
*France makes wide use of this type of device which lifts 1½ tons at a radius of 21 feet and 3½ tons at a radius of 11 feet and which can be lowered so that it requires only ten feet of head room.*

**A** FRENCH firm, the Société d'Appareils de Léverage Automobile of Paris, has developed a crane which is built on a motor truck chassis, and we understand that cranes of this type are widely used in France on railroad sidings and for port work. The illustration shown herewith, which was redrawn from *The Engineer*, shows that the crane has a considerable jib radius and lifting range.

The first cranes produced by the firm were designed for a maximum lifting capacity of only 1¼ tons, and a need was soon felt for a larger and more powerful machine, hence plans were prepared for a new design capable of dealing with loads of from about 1½ tons at a radius of 21 ft. up to nearly 3½ tons at a radius of 11 ft. In modifying the early design, opportunity was taken to enlarge the power of the engine and to re-design the jib, so that

an increased height below the crane hook and a larger radius were given. The supporting frame-work of the crane was also modified so that the jib can now be lowered into the running position indicated in the illustration, in which position the crane will easily pass under the lowest of the railway loading gages used in France. Another important improvement was the lowering of the counterpoise weight container to the position shown in the drawing, which permits of the operator obtaining an all-round view, greatly facilitating the handling of the crane.

The frame of the vehicle tapers uniformly from near the front. Cross members stiffen the structure so that it offers a considerable resistance to deformation. The method of suspension adopted calls for special mention. As shown by the drawing, the rear axle is attached directly to the chassis without any intervening springs, and only



*Showing the arrangement of the self-propelling jib crane of French design which supplies a variety of needs on railroad sidings, and at freight depots of ports and stations*

the front axle is supported on semi-elliptic springs of the normal type. This arrangement permits of small relative displacements between the front and the rear axles. When the vehicle passes over uneven ground, any stress resulting from chassis deformation is taken by the front springs, and not by the chassis itself. After the crane has been moved into lifting position, the front axle is locked to the chassis frame by means of two threaded couplings. The locked chassis, it is claimed, forms a very stable substructure for the crane, and all lifting and slowing operations may be carried out without any vibration of the chassis taking place.

### Dimensions, Power and Speeds

Following are the principal specifications:

#### Chassis and Crane—

Overall length of crane in running position...	30 ft. 6 in.
Overall width of crane.....	8 ft.
Overall length of chassis.....	19 ft.
Maximum width of chassis.....	5 ft. 5½ in.
Minimum width of chassis.....	4 ft. 3 in.
Wheelbase .....	12 ft. 5 in.
Width of track.....	6 ft. 9 in.
Total weight of vehicle and crane.....	10 tons
Lifting speed, per minute.....	26 ft. 3 in.
Jib radius—Minimum.....	11 ft. 1½ in.
Maximum.....	21 ft. 4 in.
Height under crane hook—Maximum.....	19 ft. 4 in.
Minimum.....	10 ft.
Lifting capacity—Maximum.....	3.4 tons
Minimum.....	1.47 tons

#### Engine and Gear-box—

Type of engine.....	Ballot 4 H.
Normal power developed at 1200 r.p.m.....	27 b.h.p.
Maximum power developed, at 1500 r.p.m.....	29.8 b.h.p.
Speed of vehicle—First gear.....	2.8 m.p.h.
Second gear.....	5.0 m.p.h.
Third gear.....	10.0 m.p.h.
Reverse .....	3.4 m.p.h.
Miles run per gallon of fuel.....	3 miles

The engine which propels the vehicle and works the crane gear develops 27 b. h. p. at a normal speed of 1200 r.p.m., and the gear-box has three speeds of 2, 8, 5, 0 and 10 m.p.h. respectively and one reverse speed of 3.4 m.p.h. By slowing down the engine, the lower speeds, the makers state, can be still further reduced to about one-third the walking speed of a man without clutch slipping taking place. A large fly-wheel is fitted, and this, combined with a dry-disc clutch, admits of smooth and progressive starting. Considerable precision in the handling of the vehicle is thereby obtained, which is very useful when traveling forward or backwards and running light or with a load on the hook, as when traversing railway tracks.

The rear axle is provided with a double reduction gear, comprising spur and bevel gears and all main bearings are ball bearings. A locking device is fitted to the differential, which permits of the driver to lock both wheels, and thus obtain better starting when working on slippery ground.

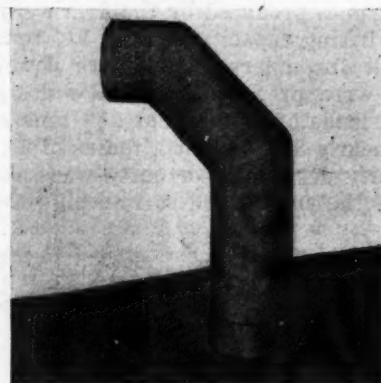
### The Crane Operating Mechanism

The hoisting gear of the crane is worked by a power take-off directly from the upper part of the main gear-box, which shaft is furnished with its own speed reduction gear. When traveling on the road the crane-operating mechanism can be thrown out of gear, which results in a saving in lubricating oil and general wear and tear. All the shafts of the crane mechanism are furnished with ball bearings, the only exception being the main bearings of the jib windlass, which are of the plain type. The crane turns on a central sleeve, moving round a fixed pivot fitted with ball thrust bearings. The gearing is enclosed and freely lubricated, while the shaft couplings are easily accessible, and are free from oil splash. At the top of central pivot is a fixed bell, which protects the bevel gears

and at the same time serves as a support for the jib-raising gear. An important improvement has been introduced to the brake gear, which is used when lowering the load. The brake has an automatic release working with a ratchet and double pawls, so that when raising the load it is no longer necessary to release the brake pedal, and as soon as hoisting is stopped, the brake is automatically applied without the aid of the driver, who may release it, as desired, when he is lowering the load.

### Filler Spout Welding

**F**ILLER spouts for fuel tanks sometimes have to be of such shape that they cannot well be made of a single piece of tubing, but have to be made up of a number of pieces welded together. This applies more particularly where the tank is located inside a compartment of the body or is rendered more or less inaccessible by such parts as a tire carrier or trunk rack. Where several parts are required and welding has to be resorted to, the operations must be carefully studied in order to keep down the cost.



Showing the filler spout after it is finished, but before it is attached to the tank

On one make of car the filler spout is made up of three parts of steel tubing cut to length in a mitering machine. The tubing is of an outside diameter of 2¼ in. and has a 16 gage wall thickness. The joints are welded and moderately reinforced, both welding operations being accomplished by means of the oxy-acetylene torch. After finish-grinding the whole spout is galvanized. When working on three-part spouts, one welder is said to have average 125 spouts per day, which means the completion of 250 welds.

Acetylene welding is used by the same manufacturer in reclaiming spouts for other purposes made from steel stampings, whereby the unit cost is said to be reduced materially.

**A** SEVENTY-TWO page book on "Instructions for Installation and Care of Thermo-Electric Pyrometers" has been published by the Brown Instrument Co. of Philadelphia. It contains information on such matters as protecting tubes for thermocouples, methods of wiring indicators and recorders, methods of eliminating cold junction errors, methods of installing couples, checking thermocouples, wiring and the accuracy of the instruments.

These subjects in a number of cases are discussed from both the theoretical and the practical points of view. Other topics dealt with include open and conduit wiring, mounting of the instruments, locating defects in thermoelectric circuits by various methods, etc. The book also contains some reference tables, including temperature-millivolt equivalents for iron-constantan thermo couples and Centigrade-Fahrenheit equivalents.



# Lighting Division Report To Feature S. A. E. Standards Meeting

Other important matters scheduled for consideration include fittings for small tubes, bumper mountings, specifications for non-ferrous metals, extension of spring definitions and changes in ball bearing dimensions. Lamp socket modifications proposed.

**A**LTHOUGH given a more important position on the program of the Summer Meeting of the Society of Automotive Engineers to be held next week at Spring Lake, N. J., the report of the Standards Committee seems to contain fewer items of immediate importance to the industry than has been the case at most other annual and semi-annual meetings of the society.

A number of division reports are to be made and many of them contain recommendations of significance. Probably the one which is of chief moment to the automobile manufacturer is that of the Lighting Division which has been inspired by complaints of State authorities to the effect that it is difficult not only properly to adjust headlamps but to maintain such an adjustment on account of inadequate fastening means and the use of sheet metal of too light weight.

Other reports meriting special mention are those of the Parts and Fittings Division dealing chiefly with fittings for small tubes and bumper mountings, of the Springs Division making certain changes in and additions to existing spring standards and of the Non-Ferrous Metals Division which amplifies and alters present specifications for bronze, brass, copper and aluminum products.

Reports on such subjects as high nuts, dimensional tolerances, wide type annular ball bearings, airplane bolts and nuts and tractor belting are made respectively by the Screw Threads, Ball and Roller Bearing, Aeronautic and Agricultural Power Equipment Divisions.

## Frequent Head Lamp Adjustment Necessary

At a joint meeting of the S. A. E. Lighting Division and the Lighting Committee of the Eastern Conference of Motor Vehicle Administrators, A. W. Devine, motor vehicle administrator of Massachusetts and chairman of the last-mentioned committee stated that the greatest difficulty the administrators experienced is the indifference of the car owners to keeping headlamps in good mechanical condition and in proper adjustment; for readjustment of present equipment is necessary every two or three weeks.

He emphasized the fact that the reason for this condition is, in many cases, poor material and workmanship, the greatest troubles being due to misformed reflectors, sagging and misplaced lamp filaments and loose lamp sockets. It was his opinion that if the car builders would not use such standards as were formulated to meet the engineering and legal requirements, laws would be enacted by several states that would require the inspection and the approval of the entire car lighting equipment. It was the feeling of the Lighting Division members that this condition was the result of the car builders demand-

ing the lowest price lighting equipment obtainable without regard to whether it would stand up in normal service.

As a result of the joint meeting, the various existing lighting equipment standards were assigned to subdivisions for review and recommendation as to revision necessary to bring them into accord with desirable lighting practice. The present specifications as revised by the subdivision and approved by the division are given in the accompanying revised specifications.

## Focusing Mechanism Important

It was recognized by the division that the type of focusing mechanism used has an extremely important bearing on legislation, as the enforcement of head lamp illumination laws could be greatly simplified if a standard could be adopted requiring that all head lamps should be focused from the exterior. A subdivision was therefore appointed to consider this subject.

## Revised S. A. E. Recommended Practice for Head Lamp Mountings

All motor vehicle head lamps shall be adjustable vertically and horizontally and mounted so that their centers are not less than 32 in. nor more than 42 in. from the ground, the preferred height being 36 in. The horizontal adjustment shall be such that the axis of the light beam will be brought parallel to the center line of the car and the vertical adjustment such as to permit tilting the projected main beam to an angle of not less than 6 deg. below a plane parallel with the road surface. All types of head lamp mountings or brackets shall comply with these mounting specifications, adjustments being made by a 1/2-in.-20 S. A. E. Standard nut in an accessible position.

**Universal Type.**—It is recommended that the universal adjustable type of mounting be used with all types of mounting brackets.

Where focusing adjustment mechanisms are used, the mechanism shall be constructed so as to permit the focusing adjustment to be made outside of the lamp body, or the mechanism shall be mounted on the back of the reflector in such a manner as to be readily accessible without the removal of the lens.

Focusing mechanisms shall be constructed of non-corroding materials to permit making adjustments freely at all times.

For alignment and stability purposes, where focusing mechanisms permit of adjustment only along, or parallel to, the axis of the electric incandescent lamp, a reflector sleeve shall be employed having:

An inside diameter of from 0.692 in. minimum to 0.696 in. maximum.

Sufficient length to permit the socket to be keyed against rotation throughout the total length of adjustment.

A friction device that will eliminate the play between the socket and the reflector sleeve throughout the total length of adjustment.

Focusing mechanisms shall permit a minimum adjustment of the filament of  $5/32$  in. forward and  $5/32$  in. backward of the focal point of the reflector with an incandescent lamp having the standard light center length of  $1\frac{1}{4}$  in.

Means shall be provided to prevent the focusing screw from backing out.

Focusing mechanisms shall be constructed so as to maintain the relative position of the reflector and the electric incandescent lamp when the door or lens is removed.

### Holding the Light Source to Closer Limits

It has been recognized for some time that road illumination could be controlled to greater advantage if the light source were held to closer limits. Lamp manufacture has improved to such a point, as a result of recent developments, that it is possible to maintain lamp filaments within about one-half the present limits. The division, therefore, recommends that the present S. A. E. standard for electric incandescent lamps be revised to specify that:

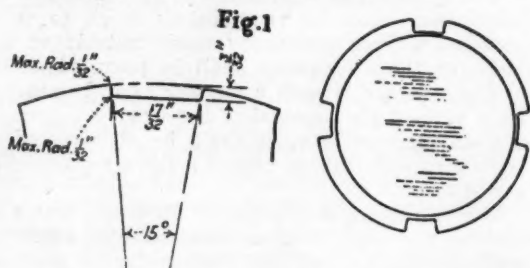
The light center length for all focusing type electric incandescent lamps used in head lamps for either electric or gasoline propelled vehicles shall be  $1\frac{1}{4}$  in. plus or minus  $3/64$  in. as measured from the center of the filament field to the bulb side of the lock pins in the base. [This is now specified as  $1\frac{1}{4}$  plus or minus  $3/32$  in.]

The longitudinal axis of the lamp filament at the focal point shall not deviate more than  $3/64$  in. from the axis of the lamp base. [This is now specified as  $5/64$  in.]

The subdivision is giving consideration at the present time to placing limits on the angular position on the base pins with relation to the plane of the filament. As it is felt that further work must be undertaken by the manufacturers before a definite specification can be approved or developed for these limits, the subdivision is giving this matter further study.

The present S. A. E. standard for lamp glasses specifies the use of straight notches to keep the glass from turning in the lamp. As a result of criticisms submitted by lamp glass manufacturers as to the shape of this notch, a subdivision was appointed to study the matter and to recommend, if possible, a better design of notch. A report, submitted to the division, was referred to the manufacturers of head lamps and head lamp glasses for comment.

Consensus of opinion as determined by this letter indicated a decided preference for tapered notches as proposed by the subdivision. The Lighting Division, therefore, recommends that the present standard be revised to specify the method of notching illustrated in Fig. 1.



The division has also made a survey of the present practice of spot lamp manufacturers with regard to lens diameters used, and finds it desirable to specify the two diameters of  $4\frac{1}{2}$  and 6 in. rather than the single diameter of 6 in. now specified. It also recommends a definite

head lamp glass diameter for motorcycles as present practice is now practically uniform.

Thickness of the bevel edge for all sizes of head lamp glass shall be  $5/32$  in. at the edge of the prism area and  $1/8$  in. at the edge of the glass, with tolerances of plus  $1/64$  in. and minus 0. This is commonly known as double thick American glass.

Four locking notches, as specified in Fig. 1, shall be used in other than plain head lamp glasses.

Glass diameter used for tail lamps shall be 3 in., with tolerances of plus 0 and minus  $1/32$  in.

As the present standard for bases, sockets and connectors had been criticized to the effect that they did not stand up in normal passenger car service, a subdivision was appointed in 1923 to consider what changes were necessary to meet desirable practice. As a result of several meetings the subdivision proposed many changes in the present standards, the principal ones being:

Gage dimensions for checking the alignment of pins and slots and the maximum outside and the minimum inside diameters of bases, plugs and sockets.

Minimum dimensions from the pin-seat to the top of the solder on the base.

The type of plunger in the socket was changed from an internal to an external spring.

A new proposed standard for gas headlamps follows:

Gas head lamps for motor vehicles shall comply with the following requirements:

**Samples for Test.**—The samples submitted to the testing authority shall be representative of the device as manufactured and marketed and shall be accompanied by printed instructions for their use as issued by the manufacturer.

**Marks of Identification.**—Each lamp must bear a distinctive designation prominently and permanently indicating the maker or name and type thereof. Each burner must be clearly marked to show the cu. ft. of gas consumed per hour at normal rating.

Gas head lamps shall be mounted perpendicularly and have a  $5/8$ -ft. burner, a 6-in. concave mirror and a clear, plain front glass.

**Burners.**—A  $5/8$ -ft. burner is one that consumes  $5/8$  cu. ft. of gas per hour.

**Mirrors.**—A 6-in. mirror is one that measures from  $5\frac{1}{2}$  to  $5\frac{5}{8}$  in. in diameter straight across the reflecting surface. Mirrors shall be curved plate glass at least  $3/16$  plus  $1/64$  minus zero inches thick, or of molded glass, ground and polished and at least  $3/16$  in. thick.

**Front Glasses.**—The front glass shall be of clear, plain glass not less than  $1/8 \pm 1/64$  in. thick.

**Motorcycle Lamps.**—Motorcycle lamps shall be mounted perpendicularly and conform with the foregoing specifications, except that a  $1\frac{1}{2}$ -ft. burner may be used.

### Flared Tube Fittings

The Parts and Fittings Division has reviewed the present S. A. E. standard for flared tube fittings and, to bring it into conformity with the other tube fitting standards and with current practice, has included the  $1/8$  and  $3/16$ -in. sizes and has eliminated the  $5/8$  and  $3/4$ -in. sizes. The widths across flats of the hexagons also have been revised to bring them into accord with the proposed standard for compression fittings. The revised standard as proposed is given in Table I.

A tentative recommendation of a set of standard dimensions for compression type tube fittings is also submitted for approval. These dimensions are given in Table II and the accompanying cuts.

It is proposed that the present standard for bumper mountings be altered to specify 20 and 21 in. for the height of front and rear bumpers respectively, instead of the present heights of 21 and 22 in.



Table I

## Proposed Dimensions for Flared-Tube Fittings

Tubing Diam. ±0.002	A <sup>1</sup>	B <sup>2</sup>	C	D	E	F	G	H	I	J	K	L
1/8	1/8	5/16-24	7/16	5/8	7/8	1 1/8	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2
1/4	1/4	3/8-24	7/16	5/8	7/8	1 1/8	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2
3/8	3/8	1/2-20	7/16	5/8	7/8	1 1/8	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2
1/2	1/2	3/4-16	7/16	5/8	7/8	1 1/8	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2

<sup>1</sup>American Standard taper pipe-threads.<sup>2</sup>All threads shall be in accordance with the Fine-Thread Series, Free (Class 2) Fit.

Tubing Diam.	M		N	O	P	Q	R	S		T	U	V
	Min.	Max.						Long	Short			
1/8	0.130	0.135	3/32	1/4	3/8	1/2	5/8	3/4	1/2	1 1/16	5/8	1 1/16
1/4	0.192	0.197	1/8	3/8	1/2	3/4	1 1/8	1 1/4	1 1/2	1 3/4	1 3/4	1 3/4
3/8	0.255	0.260	1/4	1/2	3/4	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/4	2 1/4
1/2	0.317	0.322	3/8	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	2 3/4	2 3/4
3/4	0.380	0.385	1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/4	3 1/4
1	0.442	0.447	3/4	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2	3 3/4	3 3/4	3 3/4
1 1/8	0.505	0.510	1	2 3/4	3	3 1/4	3 1/2	3 3/4	4	4 1/4	4 1/4	4 1/4

Table II

## Proposed Dimensions for Sleeves, Nuts and Straight Threaded-Ends

Tubing Diam. ±0.002	B	Sleeve Bore C ±0.002	Stock Diam- eter <sup>1</sup> D	Small Diam- eter of Taper E	F <sup>2</sup>	G	H	I ±0.002	J Mini- mum	K <sup>3</sup>
1/8	3/16	0.130	3/16	0.140	5/16-24	3/8	3/8	0.136	1/4	3/16
1/4	1/2	0.193	1/2	0.205	3/8-24	1/2	1/2	0.196	3/4	1/2
3/8	3/4	0.257	3/4	0.269	1/2-20	3/4	3/4	0.261	1 1/4	3/4
1/2	1 1/4	0.323	1 1/4	0.335	3/4-16	1 1/4	1 1/4	0.328	2 1/4	1 1/4
3/4	2 1/4	0.386	2 1/4	0.398	1 1/2-12	2 1/4	2 1/4	0.391	3 1/4	2 1/4
1	3 1/4	0.515	3 1/4	0.527	1 3/4-10	3 1/4	3 1/4	0.531	4 1/4	3 1/4

All dimensions in inches.

<sup>1</sup>A short flat will appear on the sleeves for the 1/4, 3/8 and 1/2-in. sizes as a result of the stock diameters selected.<sup>2</sup>All threads shall be in accordance with the Fine-Thread Series, Free (Class 2) Fit as given in the S.A.E. Standard for Screw-Threads.<sup>3</sup>Also minimum usable length of threads on the double-end straight fitting.

## Proposed Dimensions for Elbows, Tees and Unions

Tubing Diam- eter A	L	Diam- eter of Hexa- gon M	N	O	P	Q	R	S	T	Diam- eter of Hexa- gon U	V	W <sup>1</sup>
1/8	1/4	5/16	3/8	1/2	5/8	3/4	1 1/8	1 1/4	1 1/2	1 3/8	1 1/2	1 1/8
1/4	3/8	3/4	1/2	3/4	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/4	2 1/4	2 1/4
3/8	1/2	1 1/4	3/4	1 1/4	1 3/4	2	2 1/4	2 1/2	2 3/4	2 3/4	2 3/4	2 3/4
1/2	3/4	2 1/4	1 1/4	2 1/4	2 3/4	3	3 1/4	3 1/2	3 3/4	3 3/4	3 3/4	3 3/4

All dimensions in inches.

<sup>1</sup>American Standard Pipe Thread.

Both ends of the unions shall be chamfered 45 deg. to the flats.

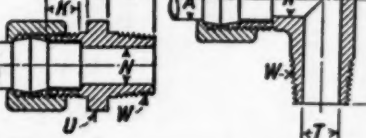
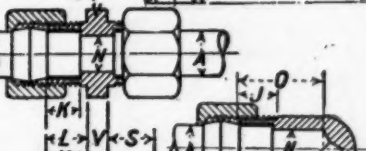
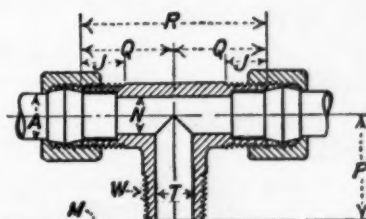
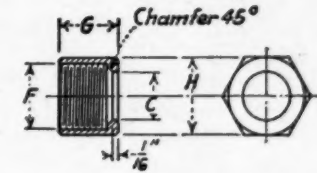
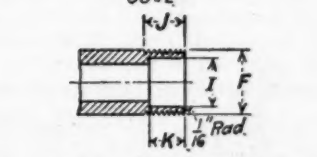
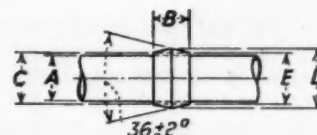
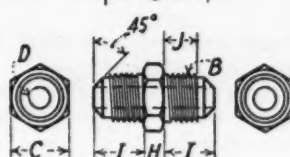
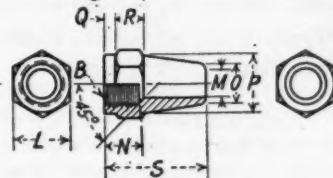
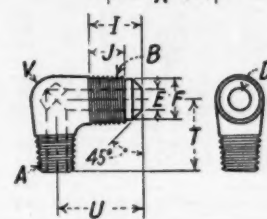
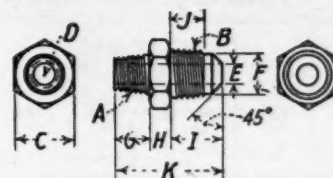


Table III

## Proposed S. A. E. Standard for Wire-Cloth

Mesh	Diameter of Wire, In.	Size of Opening, In.	Proportion of Openings to Total Area, Per Cent <sup>1</sup>	Mesh	Diameter of Wire, In.	Size of Opening, In.	Proportion of Openings to Total Area, Per Cent <sup>1</sup>
8	0.028	0.097	80	45	0.0095	0.0130	34
10	0.025	0.075	58	50	0.009	0.0110	30
12	0.023	0.060	52	60	0.008	0.0090	29
14	0.020	0.051	51	70	0.007	0.0073	26
16	0.018	0.044	51	80	0.006	0.0068	29
20	0.016	0.034	46	90	0.005	0.0059	28
24	0.015	0.027	42	100	0.0045	0.0055	30
30	0.013	0.021	40	120	0.004	0.0043	26
35	0.011	0.018	40	150	0.003	0.0037	31
40	0.010	0.015	36	200	0.0021	0.0029	33

<sup>1</sup>This column is given for general information only.

In Table III is given the Parts and Fittings Division's recommendation for a standard for wire cloth. In this table

Mesh denotes the number of openings per inch.

The weave shall be what is known as "plain," except that in meshes 80 and finer, "twilled" weave may be used.

Double-cripped wire shall be used and woven so as to give square openings.

The accuracy of spacing wires shall be such as to give openings within 10 per cent, plus or minus, of the openings specified.

The variation in the diameter of the wire shall not exceed the following plus and minus tolerances:

	Inch
Up to and including 16 mesh	0.003
From 20 to 50 mesh	0.002
From 60 to 100 mesh	0.0015
Above 100 mesh	0.001

The material shall be specified by the purchaser, taking account of the fact that at present manufacturers of wire-cloth stock these meshes in steel and brass up to about 80 mesh; above this it is common practice to supply phosphor-bronze and monel-metal.

It is proposed by the Springs Division that the present S. A. E. recommended practice for truck springs be extended to specify the same dimensions for 2½-ton trucks as are now specified for 2-ton trucks. The division also recommends adoption of the proposed standard for leaf spring stock contained in the accompanying Table IV. If adopted, tolerance requirements for such stock, already a part of the recommended practices of the society, will be consolidated with the stock dimensions.

Table IV

## Proposed Standard Leaf-Spring Stock Dimensions

Width, In.	Thickness, B.w.g.	Width, In.	Thickness, B.w.g.
1¾	2	2¼	5
1¾	3	2½	3/8*
1¾	4	2½	5/16*
2	5/16*	2½	2
2	2	2½	3
2	3	2½	4
2	4	3	7/16*
2	5	3	3/8*
2	6	3	5/16*
2¼	3/8*	3	2
2¼	5/16*	4	1/16*
2¼	2	4	3/8*
2¼	3	4	5/16*
2¼	4		

\*Thickness in inches, not B.w.g.

The following proposed standard definitions intended to apply primarily to semi-elliptic springs also are submitted by the Springs division:

## Proposed S. A. E. Standard for Leaf-Spring Definitions

**Load.**—The number of pounds to be carried by the spring. The Rated Load is the number of pounds to be carried by the spring at a given spring-height and includes the body, passengers or normal pay-load for which the vehicle is designed.

**Unsprung Weight.**—The total weight of all parts not supported on the springs, including springs, axles, wheels, rims and tires.

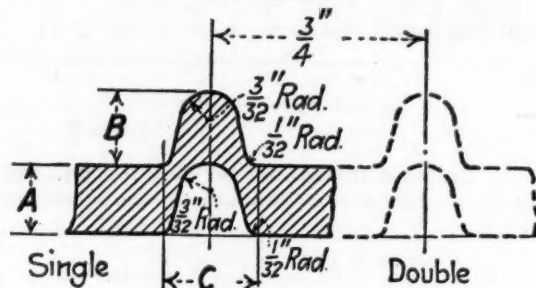
**Spring Height.**—The normal distance from a line through the centers of the spring-eyes to the face of the spring-seat at its center. The Load Height is measured with the spring under its rated load.

**Clearance.**—The maximum distance the spring can deflect from a given position. The Load Clearance is measured from the rated load position of the spring.

**Opening.**—The normal distance from a line through the centers of the spring-eyes to the face of the main leaf in line with the center of the spring-seat.

**Length.**—The distance between the centers of the spring-eyes. The Load Length is measured with the spring under rated load.

Table V



Type of Spring	A Min.	B	C	
			Max.	Min.
Passenger-Car.....	0.238	¼	0.323	0.303
Motor-Truck.....	0.284	5/16	0.353	0.333

**Flexibility.**—The number of pounds required to deflect the spring 1 in. measured over the range of from 75 to 125 per cent of the rated load.

**Deflection.**—The travel in inches of the spring under the application of a specified load.

A further proposal in the report of the Springs Division is that dimensions given in the accompanying Table V be adopted as recommended practice for leaf spring nibs.

It is proposed also that the present recommended practice for spring offsets and resulting ends be cancelled as not conforming to best present day practice.

After considerable discussion it has been agreed that it is advisable to retain in the S. A. E. standard spring specifications only that part relating to leaf spring tests. It is recommended that other parts containing the so-called "specifications" themselves, be cancelled. The portion retained is to be revised to read as follows:

All leaf springs shall be tested in an upright position and supported so as to permit free movement. All linear measurements shall be made to the nearest 1/64 of an inch. All load readings shall be made to the nearest load in pounds divisible by 5 lb.

All tests or inspection measurements shall be made



after rapping the leaf spring in the test or inspection position.

To make the present specifications for wrought non-ferrous metal alloys conform with those of the United States Ordnance Department and the Federal Specifications Board, the Non-Ferrous Metals Division considers it advisable to recommend the following among other changes in the present specifications:

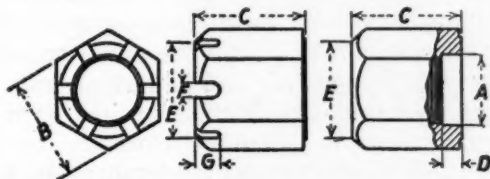
**Specification No. 69, Wrought Aluminum Bronze**

The elongation specified should be changed to read: 20, 25 and 30 per cent instead of 30, 28 and 25 per cent. The tolerances for the permissible thickness variations as given in a table (not here reproduced) should be included.

At the request of H. L. Pope of the Wright Aeronautical Corporation, the Division has considered including in the specifications of the Society the several classes of aluminum alloy specified in the Navy Department Specification No. 46A1 dated Jan. 2, 1924. It is believed that Class No. 2 alloy is used extensively enough in the automotive industry, in automobile body parts as well as in aircraft engine parts, to warrant its inclusion in the present specifications. The division therefore recommends that the present aluminum alloy specifications be

**Table VI**

**Proposed S. A. E. Standard for High Nuts**



Size (A)	B	C	D	E	F	G
1/4	3/16	3/8	1/8	25/64	5/16	1/8
5/16	1/2	17/32	3/16	29/64	5/8	3/16
3/8	5/8	17/32	3/16	29/64	5/8	3/16
1/2	3/4	17/32	3/16	29/64	5/8	3/16
5/8	7/8	17/32	3/16	29/64	5/8	3/16
3/4	1 1/16	17/32	3/16	29/64	5/8	3/16
7/8	1 1/4	17/32	3/16	29/64	5/8	3/16
1	1 1/2	17/32	3/16	29/64	5/8	3/16

All dimensions in inches.

extended to include Specification No. 35, which is based on the said Navy Department Specification No. 46A1.

**Aluminum Alloy Specification No. 35**

Composition in percentage:

Aluminum, min.	92.50
Copper, max.	0.60
Iron, max.	1.00
Silicon	4.50 to 6.50
Zinc, max.	0.20
Manganese, max.	0.20

**General Information.**—The minimum tensile strength of test specimens about 1/2 in. in diameter of this alloy cast in sand and tested without machining off the skin, should be about 16,000 lb. per sq. in. with a minimum elongation of 3.5 per cent in 2 in.

This alloy is intended for automobile body parts and other parts that must be cast in thin sections. The alloy withstands salt water corrosion very well and is therefore suitable for aircraft engine parts or other parts that may be subjected to severe corroding influences. The alloy has a relatively low yield point and therefore great strength or stiffness cannot be required.

The report of the Agricultural Power Equipment Division deals chiefly with a proposed recommendation for leather, canvas and rubber driving belts. It is proposed also that the present standard relating to tractor speeds be revised to read:

Normal tractor speeds, when measured on the driving wheels or by an equivalent method, shall be 2 1/4, 3, 4 and/or 10 m.p.h.

It is further recommended that the present standard tractor specifications be cancelled and that the following item in reference to tractor takeoff speed be approved:

Normal speed of the power takeoff of tractors designed for operating tractor-propelled agricultural implements shall be 536 r.p.m., the rotation to be clockwise when looking in the direction in which the tractor travels.

As a result of extensive tests conducted by F. G. Hughes of the New Departure Mfg. Co., who was appointed to investigate the suitability of the present widths of the smaller sizes of the wide-type annular ball bearings, the Ball and Roller Bearings Division recommends that the present S. A. E. standard for wide type annular ball bearings be revised as indicated in the following table:

Bearing No.	Present Width	Proposed New Width
200	1/2	9/16
201	1/2	5/8
202	1/2	5/8
203	1/2	11/16
204	3/4	13/16
205	3/4	13/16

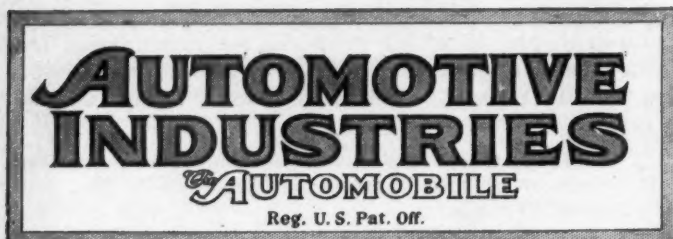
Five rules concerning dimensional tolerances and a proposed S. A. E. standard for high nuts are the subjects covered in the report of the Screw Threads Division. The proposal in reference to high nuts is covered in the accompanying Table VI.

**I**NVESTIGATIONS carried on by the Bureau of Standards have shown that when beryl is substituted for feldspar in the manufacture of porcelain in amounts varying from 25 to 45 per cent of the total mixtures, the other components being silica and clays, a product is obtained which displays a very high electrical resistance and low thermal expansion. This porcelain is therefore considered a very promising material for electrical uses. Owing to the scarcity of beryl, there has been no commercial production of this type of porcelain.

**S**OME tests on the relative efficiencies of plain or floating bushing bearings and roller bearings for trailer axles were carried out by Professor Becker at the Technical High School in Charlottenburg and are reported by him in *Der Motorwagen*. One axle had a floating bush 2 3/4 in. in diameter and 9.65 in. long and the other was fitted with two S. K. F.-Norma roller bearings. The results obtained are summarized in the following table:

Bearing Load,	Bearing Losses in Horsepower,		Roller Bearings	
	Floating Bushings			
1,165	0.04	0.09	0.005	0.025
990	0.11	0.22	0.02	0.06
1,820	0.11	0.22	0.03	0.06
2,640	0.16	0.30	0.03	0.09
3,300	0.20	0.31	0.05	0.11

It was found that the starting resistance was only from one-sixth to one-fourth as great with roller bearings as with plain bearings.



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### THE CLASS JOURNAL COMPANY

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## Horace M. Swetland

WITH the passing of Horace M. Swetland, the automotive industry has lost one of its pioneer thinkers. Through his personal activities, as well as through his vast trade paper organization, he added very materially to the rapidity and the soundness with which the motor vehicle industry has grown.

The ideas generated by his keen mind have become so firmly embedded in numerous organizations and in the hearts of so many scores of individuals throughout the industry that the practical doctrine of productive service which he preached so ably during his lifetime seems certain to be carried forward.

The quiet dominance, the warm geniality, and the human appeal of his remarkable personality will live forever in the remembrance of those who knew him and will continue, in the future as in the past, to influence their lives toward the high goal of constructive achievement. The automotive industry has lost a leader and a friend.

## The Subdealer Problem

ONE day we asked a big city distributor of cars: "Who are your most troublesome competitors?" And he answered: "My own dealers." He meant the ten or dozen subdealers, associate dealers, or community dealers, whatever one prefers to call them, handling his make of car within or near the limits of the city.

It is easy to understand why the distributor made the statement. He was speaking, of course, of his retail department, and telling in three words what was happening to it and what is happening to the retail departments of many distributors and factory branches throughout the country handling some of the popular priced cars.

Until the past few years the distributor or factory branch was the wholesaler of cars for a considerable territory, containing anywhere from twenty-five or fifty to three or four hundred dealers. These dealers were located outside the city. In the city itself, and usually for a considerable territory around it, the distributor or branch was the retailer, and its salesroom the only retail headquarters for that make of car.

Since the tremendous movement of manufacturers toward quantity production, requiring multiplication of retail outlets, not only has the rural county been sprinkled with dealers instead of having only one at the county seat, but the distributor has been forced by circumstances and factory pressure to set up numerous independent retail dealerships in his own municipality, in most cases making them his competitors and competitors of each other on an open territory basis. The result has been keen competition, often demoralizing competition.

One factory branch manager told recently of subdealers who made a practice of sending prospects with used cars to the branch for appraisals, telling them to report back with the appraisal offer "and we'll give you \$25 more." The branch carried the cost of an appraisal department. The branch's subdealers used it for indirect price cutting purposes. Quite likely officials at the factory did not concern themselves as long as cars were sold and the branch did not lose money.

It cannot be expected that the industry will go back to the days when all the cars were sold and, to an extent, serviced in the large cities from distributor and branch establishments. The extent of motor car use and the convenience of motor car buyers and users will prevent any such recession as that. The real problem is to eliminate the subdealers who are bad and educate those who are good, also seeing to it that additions to the ranks of this class of retailer come from the ranks of honest and capable dealers and salesmen. Manufacturers and branch managers can do a good work for the future of the trade in general by doing everything possible to get subdealers and prospective subdealers to attend informative meetings, read informative trade literature and generally educate themselves to be businesslike merchants. The subdealer problem need not be hopeless if it is approached in a constructive way.





*Horace Monroe Swetland*

# Horace Monroe Swetland

**H**ORACE MONROE SWETLAND, president of the United Publishers Corporation and its subsidiary, The Class Journal Co., publishers of AUTOMOTIVE INDUSTRIES, died at his home in Montclair, N. J., at noon on Sunday, June 15. For over a year Mr. Swetland's health had been failing, following a serious illness.

Last November he suffered a relapse, and in spite of a trip to Florida was unable to ward off the inevitable attack which forced him to give up his office work after Decoration Day. Two weeks and three days later pneumonia ended his career. He was in his seventy-first year.

Mr. Swetland was one of the two or three outstanding personalities in the field of business and industrial publishing in America. The last 44 years of his life were spent in building up his publications in different industries.

His entry into the automobile publishing field was in 1902, after he had disposed of the magazine *Power*. This was a steam engineering journal which he had controlled for 12 years. He disposed of it in 1900.

Mr. Swetland founded The Class Journal Co., present publishers of AUTOMOTIVE INDUSTRIES, *Motor Age*, *Motor World*, *El Automovil Americano*, *The American Automobile*, and *Distribution & Warehousing*. He was the directing genius in the publication of these magazines from the day he purchased *The Automobile* in 1902. In the same year he bought from Emil Grossman of Cleveland the *Motor Vehicle Review* and the *Dealer and Repairman*. These three papers he merged into *The Automobile*, which later became AUTOMOTIVE INDUSTRIES. After 1902 Mr. Swetland found it necessary to purchase *The Automobile Magazine* in order to have the clear title which he desired to the name, *The Automobile*.

From the time at which this transaction was completed in 1902, Mr. Swetland had but one ideal in life, that of giving his best talent to the up-building of the motor vehicle industry, which even in those early days gave evidence of what the future was to unroll. After the first experience with his pioneer steam car, Mr. Swetland was an automobile enthusiast. His ardor knew no bounds.

Mr. Swetland's life work was building business publications and the second half of his business career was devoted to laying the broad foundation for and the building up of the Class Journal group of magazines. To him, publishing automotive magazines primarily was a form of service. From the early 80's, when he entered the field of business publishing as reporter, advertising solicitor and subscription man for the *Boston Journal of Commerce*, he had a clear vision of the tasks to be

performed by a constructive business publication. He visualized such a magazine as an integral part of the industry which it represented, and he conceived its sole function to be that of service to its readers.

His early boyhood on his father's farm in Chautauqua County, New York, introduced him to the rigors of nature and implanted in him the seeds of business sagacity.

The work Mr. Swetland did in building up a group of motor magazines, beginning with *The Automobile* in 1902, represents a realization of a life ambition, although since 1912 his duties as president of the United Publishers Corp. have required that he give considerable attention to the iron and steel, the textile and other industries. The United Publishers Corp., which is one of the largest publishers of business magazines in the world, prints *The Iron Age*, *Hardware Age*, *Dry Goods Economist*, *Boot and Shoe Recorder*, and other magazines.

It required only the two years between 1902 and 1904 to give Mr. Swetland a vision of the future of the motor vehicle, despite the fact that the industry at that time was still in its swaddling clothes. He was one of the group which early sensed the need for good roads to carry the constantly increasing number of motor vehicles. His purchase of the *Automobile Blue Books* from C. H. Gillette, Hartford, Conn., was one result of his understanding of the need of good roads and of such information as would enable tourists to use those roads to the best advantage.

While Mr. Swetland never owned a good roads magazine, he gave substantial support to some of his friends in this field and never permitted the editors of his motor papers to lose sight of the necessity for good roads.

The founding of the *Automobile Trade Directory* in 1903 was but another expression of the will to serve. Robert Wolfers, also an up-State boy, was placed at the helm, and he has been captain of the ship from the date of its inception. Each step forward in the industry saw this activity widen and grow.

The year 1907 witnessed another step in Mr. Swetland's lifework of service to the industry. In that year the *Commercial Vehicle* was founded for users of motor trucks, motorbuses and taxicabs. H. F. Donaldson, one time president of the Society of Automotive Engineers, was put in charge of this magazine and carried on until his death in 1912.

Financial crises always served to stimulate Mr. Swetland's ambition. It was only natural that out of the depression of 1907 there should emerge a new



chapter in his lifework. In January he purchased *Motor Age*, published in Chicago by N. H. Van Sicklen, Sr., which had been founded in 1901 by S. A. Miles.

The purchase of *Motor Age*, and of *Motor World* some years later, went to form what has become known as the "big three."

Reverting again for a moment to 1904, we get another close-up of Mr. Swetland's conception of the sort of business publications upon which a great industry must be built.

Mr. Swetland was a pioneer in the conception and founding of the Society of Automotive Engineers as a organization to represent the entire automotive industry. The genius and development of the S. A. E. was as follows:

During the history of the Association of Licensed Automobile Manufacturers considerable time and money were spent in developing engineering ideas for the benefit of the members. There was what was known as the mechanical branch, which owned and operated a small laboratory in Hartford, Conn. The results of investigations were given only to the members of the association. The association was composed of those makers who were licensed under the Selden patent. Mr. Swetland conceived the idea that a society should be formed to function for the benefit of everyone interested in the automobile industry and the matter was discussed several times with leading engineers engaged in the automobile industry.

A. L. Riker, then engineer of the Locomobile Co. of America, president of the mechanical branch of the Association of Licensed Automobile Manufacturers favored the idea of an independent organization; and during the New York automobile show of 1904 a decision was made to form the Society of Automobile Engineers, for those interested in the design and construction of the automobile. Three men were present at this meeting, Mr. Swetland, A. H. Whiting, and E. T. Birdsall. A formal organization was effected at that time by naming A. L. Riker as president and E. T. Birdsall as secretary.

From that day in 1904 until his illness forced him to leave his office for the last time, Mr. Swetland was a strong supporter of the S. A. E. and was a regular attendant at all of its meetings. He had planned definitely to attend the summer meeting at Spring Lake, next week.

Mr. Swetland availed himself of two additional opportunities of service which appeared before his death.

The first came in 1916 when it became apparent that American automotive manufacturers needed assistance in the development of foreign trade. A demand for motor vehicles was coming from foreign countries particularly from the Spanish and Portuguese speaking nations. The rapid increase of production of motor vehicles made it apparent that sooner or later foreign markets would be necessary if the entire output of American factories was to be sold at a profit. Mr. Swetland, to use his own

words, "Wanted an opportunity to give some special service as a memorial of my purpose." To meet this need *El Automovil Americano* was founded in 1917, which was intended as a direct line of contact between American manufacturers and Spanish and Portuguese speaking lands. Mr. Swetland realized that the world could be reached in English and Spanish and felt that with the establishment of *El Automovil Americano* he had accomplished half of the task. The second half of the task was completed a few months before his death by the founding of *The American Automobile* (Overseas Edition).

The final chapter of his business life was written in the autumn of 1923 when the United Publishers Corp. purchased the Chilton Co. of Philadelphia, with its numerous automotive publications. This company was merged with the Class Journal Co. into what is known as the Automotive Division of the United Publishers Corp.

Had fate spared him other activities would have been recorded but his task was completed, the call had come, his last ride behind the steering wheel was over, his last "well done" had been uttered and other hands were left to carry on.

Mr. Swetland was born in Chautauqua County, New York, November 16, 1853.

Throughout his business career, Mr. Swetland actively supported organizations in the publishing field. He was for a time president of the Associated Business Papers, the national association of publishers of such magazines, and he gave his complete support to that association until the last.

Two years ago he conceived and organized an educational course for training those engaged in all phases of business publishing. He arranged for a course of study which was carried on in many cities throughout the country, writing a book entitled: "Industrial Publishing" which constitutes a textbook on the subject.

Mr. Swetland was president of the National Publishers Association, an association of the large general magazines, monthly and weekly, of the country.

Besides being president of the United Publishers Corp., president of the Class Journal Co. and president of the Federal Printing Co., Mr. Swetland held a similar position with the U. P. C. Realty Co. and the Swetland Realty Co. He was a director of the Commercial Trust Co., New York.

Mr. Swetland was a member of the following clubs: Union League, New York; Engineers Club, New York; Engineers Country Club, Automobile Club of America, Montreal Golf Club.

Mr. Swetland is survived by his widow, Mrs. Clara A. Swetland, and four children, Mrs. Frederic C. Stevens, New York; Mrs. Maurice J. Kane, Montclair, N. J. and Mrs. Dr. Peter Clare Johnson of New York; and M. J. Swetland, Redlands, Cal. He is also survived by his brother A. B. Swetland who for thirty-seven years has been manager of his publication interests in the automotive field.

## Leaders of Automotive Industry

**I**N the passing of Horace M. Swetland, the industry, as well as a host of individuals, has lost an inspiring friend. There is nothing more grateful, more cherished or more valuable than an inspiring friend.

It has been said that the most eloquent has but one thought; his apparent variety is but reiteration. Mr. Swetland exemplified balance, poise, keenness, moderation and enduring ability. He was a consistent friend and a lasting example of the effectiveness of teamwork, loyalty and cooperation. He was not actuated by small motives; therein lay largely the key to his character and success. He had an open mind, and was always ready to act when the right time came. He was essentially practical.

The Society of Automotive Engineers never had a more sincere or devoted friend than Mr. Swetland. Conceiving the field of its work, and taking a major part in its organization and upbuilding, he continually had its interest at heart. As chairman of its finance committee for many years, the advice he freely gave was invaluable.

Conspicuous among the traits of our friend were his geniality and constructiveness. His good humor, as well as sound sense and modesty, was almost never-failing. His perception of right and justice was clear and ever tenaciously held. It is doubtful if the automotive industry ever had a better adviser from the standpoint of soundness and fearlessness.

In addition to his forty years of work in managing industrial periodicals, Mr. Swetland produced two books which record in the main his experience, ideas and constructiveness. The titles of these well prepared, interesting and valuable volumes are "Industrial Publishing" and "American Journalists in Europe." In the former we read, "The function of an industrial periodical is to provide educational and informative material well abreast of or in advance of industrial practice." Also, that "the great power of leadership lies in the ability to make the proper adjustment between the capacity and responsibility of men. This power is the genius of organization." He made it clear that when right principles are followed, all else is of minor importance. He embodied that inscrutable something which we must recognize as soul in man.

"Lord of a thousand worlds, I am;  
"I've reigned since time began;  
"And night and day, in cyclic sway,  
"Pass by while their deeds I scan,  
"Yea, time shall cease ere I find release,  
"For I am the soul of man."

Our friend was a man. We shall long remember him as such.—COKER F. CLARKSON, Society of Automotive Engineers.

**F**EW men are as modestly appreciative of their own ability as was Mr. Swetland. Few appreciate how important a part he has played in the elevation of class journalism from a game to a profession of unexcelled dignity. Soon after I became acquainted with him he retired from business. In three weeks he was back in New York and as he expressed it looking for a job. That

was characteristic of the man. He had never learned to play as most men play. His work was the one object of his life. Not merely for gain, however. Profit was a secondary consideration. To excel in the production of his periodicals and to make them educational and instructive was his main object for he was at heart, as well as at one time in fact, an educator.

"By combination and purpose he absorbed all of the features of automobile journalism that seemed to him worth preserving. In so doing he also established as substantial business men with proprietary interest in his publications many of those who now are mourning sincerely his passing while rejoicing in the accomplishments of his companies. He invariably gave credit to his associates. I believe that by his passing we have lost the greatest exponent of educational journalism I have ever known and one of the squarest, most considerate and most capable of men of my acquaintance."—S. A. MILES, National Automobile Chamber of Commerce.

**I**T is not so much with a man's accomplishments that we are concerned when he has left us as with his personality and character. Mr. Swetland was indeed successful but our first thoughts of him are of one we might call truly a business gentleman."—H. H. RICE, Cadillac Motor Car Co.

**I** AM deeply moved by learning of your loss through the death of Mr. Swetland. Those who had the privilege of even an occasional contact with him realize that his absence means a loss to the entire automotive industry.

"With unusual foresight he realized many years ago the contribution which he could make to the industry's development through the medium of his papers. I think it may properly be said that he exerted an unusual influence for good through his chosen work.

"Those who enjoyed more than a casual acquaintance with him will keenly miss the charm of his personality and warmth of his friendship."—M. L. HEMINWAY, The Motor and Accessory Manufacturers Association.

**A**NNOUNCEMENT of Mr. Swetland's death is a great shock and terminates an intimate friendship of over twenty-five years during which time I have worked with Mr. Swetland and learned to esteem his judgment and admire his wonderful personality. In Mr. Swetland we have lost a man of the sterling type so much needed during these days."—H. W. ALDEN, Timken Roller Bearing Co.

**T**HE men in the Jordan organization desire me to express their great sympathy for the loss of H. M. Swetland. The influence of Mr. Swetland in the industry and the good that he has done toward promoting the interest of all engaged in the business has been so great that no one can possibly calculate the loss that we have sustained."—EDWARD S. JORDAN, Jordan Motor Car Co.



## Pay Tribute to H. M. Swetland

"FROM the time that he came into the industry to almost the time of his death, Horace M. Swetland has been a tower of good judgment regarding automobile affairs that has made him an outstanding figure whose good work will be beneficial for years to come.

"He was not alone a great publisher and editor, but a sound economist on the making and marketing of motor cars, with a broad viewpoint of the industry and its progress.

"He was not afraid to offer constructive criticism, which was always welcomed by the leaders in the industry. He seldom missed an important gathering and his kindly and courteous treatment of all whom he met will be sadly missed in the future.

"President Clifton and the other Directors join me in extending our deepest sympathy to the members of his family and to his associates in the publishing field."—ALFRED REEVES, National Automobile Chamber of Commerce.

"TO those privileged to know him intimately the outstanding quality in H. M. Swetland was his ever-young viewpoint, his fresh outlook, combined with his wonderful business capacity, his marvelous, clear sighted vision. His services were of inestimable value to this industry in the days of its swaddling clothes. He made a success of his enterprises because he loved the work. He loved this industry and the men in it. His abilities, his time and resources were always at the disposal of a friend.

"The motor car industry has lost one of its bulwarks, his family a devoted father and husband, and his friends and the world, a man. We who were honored by his close friendship feel a gap—a loss 'hat will never be filled."—F. E. MOSKOVICS, Franklin Motor Car Co.

"I WAS deeply grieved and shocked to learn of the death of Horace M. Swetland. I considered it an honor to esteem him as a personal friend. His death is a distinct loss to the Society of Automotive Engineers and the automotive industry. He was a most important factor in the industry and particularly in promoting the interchange of ideas, something which has occupied front rank in bringing automobile manufacturing to the position it occupies today."—J. G. VINCENT, Packard Motor Car Co.

"I AM greatly shocked at the sad news of the death of Horace M. Swetland. I find myself unable at the moment to give expression to the feelings in my heart at his passing. He was my good friend and fellow-worker for forty-six years. He came to my home town, Panama, Chautauqua County, N. Y., as principal of the high school when I was sixteen years old and I was his pupil for two years. Thus began a close friendship which has been unbroken with the lapse of time.

"In those early years in the management of the school he showed decided organizing ability and gave evidence of those qualities of heart and mind which made him the great man that he became.

"In 1882 Mr. Swetland gave up teaching and joined Emerson P. Harris, another Chautauqua County boy who had taken up publishing work in Boston. When, early in 1885, they offered me an opportunity to join them in the publishing business I was glad to accept, although I had prepared myself for a career as a teacher.

"Mr. Swetland's success as a man and a publisher was due to a rare combination of personal qualities and business acumen. He was a tireless worker; had great penetration, concentration and perseverance; was an organizer of first rank; was always a cooperator.

"His ideals in publishing were high, service to the readers of his publications being his first consideration. His book, "Industrial Publishing," completed only recently, is an epitome of the publishing standards which he set for himself at the outset, although he drew his illustrations from many sources. This book also illustrates his persistence in bringing to fruition a dream which had been with him for many years.

"The publishing business has lost an outstanding figure in the passing of Horace M. Swetland, but his work will endure in the great business institutions to which he gave unstinted devotion and in the lives of those whom he trained in the technique of publishing and encouraged to make the most of their abilities and opportunities."—JAMES H. MCGRAW, McGraw-Hill Co., Inc.

"BUSINESS journalism and the automotive industry have lost a sincere friend and valued leader through the death of Horace M. Swetland. He was among the first to vision the great future ahead of the automotive industry and gave evidence of his faith in it and his courage by investing heavily in that future.

"The great publishing institution which he founded is a monument to that faith and the instrument with which he gave expression to ideals which have always been an inspiration and a constant help in the advancement of the industry."—W. C. WHITE, The White Motor Co.

"HORACE SWETLAND was one of the earliest figures in the automotive industry and a man whose habits of mind were always constructive. He proved himself a forceful and elevating influence in the building up of this great business of producing highway transport."—ROY D. CHAPIN, Hudson Motor Car Co.

"MR. SWETLAND'S death is a great loss to the automotive industry. He was a genuine pioneer in dignified and inspiring journalism and thereby was a factor of large importance in the development of the industry along sane lines."—CHARLES CLIFTON, Pierce-Arrow Motor Car Co.

"PLEASE convey to the family my sincerest sympathy in the great loss they have sustained. I am sure his many friends and associates will miss his wise counsel and sound judgment."—S. W. WHITMORE, Whitmore Mfg. Co.

# Present Production Lull Normal

## *Cessation of Work in Some Factories Will Enable Dealers to Move Accumulated Stocks and Prepare to Receive New Output*

NEW YORK, June 16—Production in automobile producing plants is showing a further tapering off in order that accumulated stocks may be cleared away by dealers as rapidly as possible. Slow conditions in the manufacturing branch of the industry are expected to continue until the middle of July.

Beginning July 1, some of the major producers will enter upon their semi-annual inventory taking and overhauling period, and their plants will remain closed for the following two weeks. This period will also be utilized to give employees their usual vacation.

As a result, few if any cars will be turned out in those factories, and dealers will be afforded their best opportunity to place themselves in a position for the reception of plant output when operations are resumed. This closing is expected to be followed by practically full schedules in the plants affected.

While the slowing down is general among automobile producers, several report that June programs are above those of May, with retail demand fully justifying the increase. These cases, however, are exceptions to the general rule.

The slackening of automobile building operations is affecting the manufacture of parts used in original assembly, and many makers are working on greatly reduced schedules, with signs of further curtailment as the month progresses. No advance is looked for until well into July, when preparations will be made for fall consumption.

### Summer Slowing Is Normal

The summer slowing down in operations is normal, even last year with its exceptional production records for April, May and June, showing a decided drop in output in July. On account of the light first quarter of 1923 and the unexpected demand developing in the second quarter, manufacturers were able to carry their high production schedules over into June.

The second quarter of this year will not show as great a production total as the corresponding period of 1923, but it is not likely that the six months' period will fall much behind the first six months of last year, if it falls behind at all. For the first five months of this year 1,749,543 cars and trucks were produced, and for the first six months of last year the total was 2,031,093. It is not improbable, despite the general slowing down in car production and the fact that June is a

short working month, that the output this month will reach the 281,550 figure necessary to bring the half-year total of this year up to that of a year ago.

## Cleveland Programs Mounting Over May

### Used Car Sales Indicate to Makers That Public Has Returned to "Buying Mood"

CLEVELAND, June 16—The slack between the production of cars and their sales by distributors for automobile manufacturers in the Cleveland district, which resulted from the backward spring weather and a general business slowdown, has now been practically all taken up, producers here report.

While no unusual increase in production and sales is expected during the coming thirty days, manufacturers do hold that they have already started to show better demands than they experienced in April and May. This is accounted for by the clearing out of distributors' stocks on hand, a general return of confidence in business resulting from the nominations of the Republican convention, and improved weather conditions.

### Used Cars Moving

Dealers' and manufacturers' associations report that the used cars for this and other territories in which they operate are practically sold out. This, they assert, means that the public is getting back to a "buying mood," which is a helpful sign for the sale of new cars.

Taken through all of the factories

in the Cleveland district, it is estimated that production will run about 12 per cent better for June than it did for May, and that this increase will be largely absorbed by immediate sales, leaving distributors' stocks low and open to the absorbing of an even greater output in July.

The experience of the retail salesrooms of Greater Cleveland is said to be typical of that in which local manufacturers sell their output in other sections of the country. May sales here were nearly 20 per cent better than those for April, and thus far in June orders have run about the same proportion over last month.

With the exception of two plants, none of the automobile manufacturers in this section are running to capacity. In a few instances plants are working men on short days and five-day weeks. This condition, however, is correcting itself, the employment index for June showing a gradual upturn.

There is no general condition which holds through the automobile parts and accessory plants of the district. About 50 per cent of them assert they are operating on full time, with ample orders ahead. Others are working but six hours a day and four days a week.

Both the Cleveland and Chandler plants report a marked increase in sales and production for the first half of June, as against that period for May. These companies are bringing out new models, for which their officers state there is a large demand. The Cleveland counts on a production of 1600 cars for the present month.

### Among the Factories

Jordan and Peerless are both experiencing a brisk demand. The same condition is reported by Stearns, and Rollin states that the present month has been by far the best since the firm went into production.

Sterling-Knight is broadening out its distribution to sections not previously touched, so that increased sales are looked for by this relatively new company in the automobile field.

White Motor has expressed its confidence in the immediate future by starting the erection of a large two-story research building. In this structure all of the experimental work of the company is to be housed.

The general belief holds that business both for parts and cars will see constant but not spectacular improvement, and that with it will come a slight and gradual increase in the retail prices of passenger cars.



## Detroit Sees Upturn in Production Totals

Sentiment Prevails That There  
Will Be An Improvement  
by Middle of Next Month

DETROIT, June 16—Vacation closing of from two to four weeks in many factories in this district is indicated by the production trend, which has been narrowing down for several weeks. It is to be expected that by the end of June many factories will be prepared for a temporary lay-off.

Manufactured stocks, in fact, have been brought to a point in several factories where vacations are now in effect. One of the largest production factories is down tight for six weeks, but this is in preparation for new models.

This is the first factory of which a report has been made of closing in preparation for new models, but several others will soon be closing for this reason. This applies, of course, only to those which are making a general model change throughout their product. Companies which are adding models to already existing lines will not close.

Through the agency of the vacation periods and the factory closings for new models, a period of from two to six weeks will be set up for dealers to clear stocks of cars in which there will be no additional stocks being made at the factories and no shipments. For the most part the vacation period will depend upon the length of time estimated to sell the stocks now built up and resumption will be on regular fall schedules.

### Fall Estimates Lower

According to present indications fall schedules will be lower than the estimates of the earlier year, and to some extent will be considerably under the regular production capacity of factories. This, as has been outlined by executives, and as borne out by action already taken, will result in gradual increases in prices which are expected to be more or less general in all lines.

Better weather of the last ten days has resulted in much better retail sales conditions and it is confidently expected that the movement of cars will be greatly accelerated from this time on. Dealers who have been handicapped by used car stocks in seeking new car business will have a much better opportunity for business from this time on.

## This Week's News

EVERYBODY is looking for new ways to make profits and is scrutinizing carefully his entire business organization for the purpose of plugging up leaks and eliminating waste. News this week about three big companies—Ford, Timken and Maxwell—is indicative of the general trend. The report that Ford is contemplating making accessories has been confirmed, although his activities in this line are not scheduled to begin immediately. Timken has decided to close down one of its plants in which it was building axles of a type on which it has been very difficult to make any profit. Maxwell has made arrangements for a new financing plan which will help its dealers to sell cars under more advantageous conditions than in the past.

Production still is on the wane but a more healthy tone appears in a good many retail markets, despite the fact that unemployment has grown to some extent during the last seven days. General Motors has announced its intention of issuing monthly figures of deliveries to consumers as well as shipments to dealers, "in order to permit a more adequate analysis of the situation."

Tire companies, led by Firestone, apparently have launched a determined drive to get rid of their small diameter wheel and rim stocks before enough cars come through with balloon tires as standard equipment to render difficult replacement sales for this type of wheel and rim equipment. The effort takes the form of offering with every set of balloon tires four wheels and five rims. Some makers are going to give away inner tubes with balloon tires suited to standard wheel sizes. On top of this comes a price reduction of about 20 per cent on balloons and 10 per cent on high pressures by one company, but as yet the others have not followed suit.

## Conservatism Ruling in Chicago District

As Soon As Upgrade Is Shown  
in Retail Conditions, Pro-  
grams Will Be Advanced

CHICAGO, June 16—The general picture of industrial activity in this section right now is one of conservatism and watchfulness. Business is more disposed to watch its corners closely than plunge in and risk the consequences of uncertainties. It is not making plans far in advance; on the contrary, playing a very tight game and feeling its way cautiously. If there are positive signs that buying interest is going to take the upgrade there will be proportionate increases of production schedules, but it is clearly apparent that such harbingers must first appear.

### Employment Situation

In some branches of production the tendency at this time is more to make further reductions, the sharp decline in employment in Illinois in May suggesting that similar conditions prevailed in that month in a great many industrial centers. There are companies that have added somewhat to recently lowered forces in the last week or so, but the employment curve most likely is continuing downward for the State as a whole.

Surveys by the Chicago office of the Illinois Department of Labor covering more than 40 per cent of the State's workers have shown reductions for the last eleven months. The drop of 2.5 per cent in May, however, was the most precipitate yet.

Illinois has lost fully a third of its employment expansion which followed the depression of 1921. One of the greatest reductions is found in automobile accessories and parts, the drop in May, according to the State survey, being 15 per cent, putting employment in this list about one-third below the level of this time last year.

In view of this general situation it is easy to understand why automobile producers of this section, as well as most other manufacturers, are calculating the future with extreme care. The automobile industry, at the same time, is in a better position than some of the others.

The factories are working on their next schedules, and chances are they will be more or less elastic. While they are all playing safe, they are optimistic, looking for improved conditions with the settling down of summer and more settled weather.

## Wheel and Rim Sets Given with Balloons

### Other Tire Manufacturers Follow Firestone's New Free Distribution Policy

NEW YORK, June 16—Until further notice the Firestone Tire & Rubber Co. will furnish without charge a set of four wood wheels and five rims with each order for a set of five balloon tires and tubes.

Hardly had the Firestone dealers received their notices of the offer than other companies inclusive of United States, Goodrich, Goodyear and Fisk followed the Firestone. It is thought that a majority of the companies will adopt a similar policy.

Firestone making only balloons, his offer is confined to free wheels and rims, but in the case of other companies, which make "interchangeables," it has been necessary to make an additional offer which is taking the form of free tubes because new wheels are not necessary.

Reasons for the Firestone offer are not given by the company, but it is said that its subsidiary, which makes wheels and rims, is overproduced on wood wheels. Realizing that next year balloon tires will be regular equipment in a majority of cases and that the demand for wood wheels will show a big decrease, it has been decided to assist dealers in making balloon sales by throwing in a set of wheels and rims.

The move is declared to be tantamount to a price reduction of at least 15 per cent on balloons. How long the situation will last is not known, for the Firestone company qualifies its statement with "until further notice."

#### Situation in Akron

AKRON, June 16—While the Firestone Tire & Rubber Co. announces that it has no statement to make, company dealers and competitors confirm the report that the company has inaugurated a policy of giving free with every change from standard to low pressure tires "all around" four wheels and five rims, all the necessary bolts for the new equipment and a wrench.

A Firestone tire dealer stated that the change to low pressure tires on a Ford car can now be made for \$100, while the price previous to the inauguration of the new policy was about \$120.

At the Firestone sales department it was stated that the company has no announcement to make regarding this report "at the present time," although the statement was taken to indicate that a formal announcement regarding the policy may be expected soon.

Firestone has been a leader in the downward movement of tire prices for the last two-and-one-half years, and because manufacturing costs are lower at

this plant than in most other tire producing plants, Firestone is able in many instances to cut prices and still retain a fair margin of profit.

It has been known for some time that the company's operations thus far have been so successful that a price cut on all lines might be expected. President Harvey S. Firestone denied several weeks ago, however, that such a reduction was to be expected.

Although the action of other Akron companies has not as yet been indicated, it is reasonably certain that the Firestone offer will be met, as has been the case in every price movement in the tire industry heretofore. The competition is so keen that it is impossible for any manufacturer to refuse a downward movement for any length of time.

Other manufacturers, however, refuse to make any comment upon the Firestone move, except to indicate privately that it was the one thing which the industrial leaders feared might mar the prospects for the second half of the year. Profits have been very satisfactory thus far this year, and only a price reduction seemed able to reduce these showings during the latter half.

The Firestone company also stands to gain in the wider use of balloon tires, which may result from the price movement through the sale of additional rims, although this is a small factor in the Firestone business as a whole. The company produces more than 65 per cent of the automobile rims of the country in its steel products department.

## Fewer Sizes of Balloons Are Hoped for This Year

AKRON, June 18—The tire contingent of the special committee of tire and automobile manufacturers, appointed by Col. Charles Clifton, president of the National Automobile Chamber of Commerce, to work toward standardization of balloon tires, is confident that before the end of the year progress will have been made in this direction.

The tire men who attended the preliminary meeting, held at Detroit several weeks ago, express satisfaction over the fact that the automobile men will cooperate as far as possible in reducing the large number of sizes now made in this type of tire.

It is stated in the tire industry that there is hope that the 22 sizes of balloon tires now being manufactured may be considerably reduced, and that the ultimate goal in the standardization process is five sizes which will fit all makes of automobiles now being manufactured. At the same time the industry realizes that car producers cannot redesign automobiles over night to make possible this standardization.

It is believed that the special committee, together with other groups, will devote a large part of the remainder of the year in this standardization program in hopes that the 1925 production year can be started with more regularity in balloon tire requirements.

## Columbia Creditors Agree to Extension

### They Express Confidence in Management and Satisfaction with Progress Made

DETROIT, June 14—Following a creditors' meeting of the Columbia Motor Car Co. this week, at which a general extension was agreed upon, President Lou R. Smith said that under the new arrangement the company would be prepared to proceed with its plans for gradually extending the business of the company. Creditors expressed confidence in the new management and declared satisfaction with the progress made.

Commenting on the Columbia situation, Mr. Smith said:

We will now be able to inaugurate certain policies that we have hesitated to put into effect before we had definitely gone through that period which every new management must face.

At the creditors' meeting we were able to show a completely reorganized business, one where every dollar has been made productive. Waste motion has been eliminated and the most efficient and up to date methods of production have cut costs to a minimum.

At the same time the Columbia six has been steadily improved. Our strict economy and sound business methods have resulted in the expression of approval and confidence that our creditors have given us.

We will continue our four-square dealer policy that has won the confidence of our sales organization. With the confidence and opportunity that the decision made by our creditors will give the organization, we entertain an exceedingly optimistic viewpoint as to Columbia's future.

Furthermore, our creditors' action has established for Columbia a splendid line of credit. In order to operate on the basis that we plan for Columbia this is an essential, and is one of the things the new management has been working toward.

## Mid-West Rubber Makers Would Limit Guarantee

CHICAGO, June 18—At a meeting of the Mid-West Rubber Manufacturers Association held at the Chicago Athletic Club, the organization went on record in favor of the movement to abolish the long time warranty and to limit the guarantee of workmanship and material in casings to 90 days. The action was unanimous.

The meeting was presided over by the president of the association, Thomas Follen of the Lion Tire & Rubber Co. of Lafayette, Ind. Among the speakers was Charles Henry McIntosh, past president of the Advertising Clubs of America, who spoke on sales promotion.

The association will hold another meeting in July or August, the exact date to be determined later. It is planned to conduct a campaign to strengthen and enlarge the organization.



## Siddeley Sees Sales Depending on Wages

English Manufacturer Says Future Here Will Hinge on Wage Earner's Condition

NEW YORK, June 18—J. D. Siddeley, managing director of Armstrong-Siddeley, Ltd., Coventry, England, manufacturer of the Armstrong-Siddeley car, expressed the opinion, before sailing home on the Mauretania last week, that the future of the motor car industry in America very largely depends on the trend of wages, because a very large percentage of the business done in the sale of cars is with wage earners who buy on a time-payment basis.

He believes that because the weekly wage earner is so great a factor that sales will bear a very definite ratio to the wage scale.

### Amazed at Prosperity

Mr. Siddeley, after spending two weeks visiting American factories, finds himself, like not a few manufacturers from Europe, amazed at the abounding prosperity in America as compared with conditions in European countries. He does not look for any abnormal developments in motor car design and is of the opinion that most constructive progress will be made by improvements and the incorporation of better engineering and workmanship in present products. He is one of those manufacturers who are not expecting any unusual progress in the development of straight-eight engines, excepting with a few manufacturers.

However, he is firm in his opinion that all of the important European cars of medium power, as well as high power, will be fitted with four-wheel brakes, but does not consider these necessary for smaller cars. Balloon tires are certain to take a dominating place in the industry just as rapidly as all the difficulties in connection with their development are mastered.

### View of Aviation Development

Mr. Siddeley, who has been a manufacturer of aviation engines since war days, believes that aviation development is almost entirely in the hands of the government and depends on the government for its expansion, which he believes can be accomplished only under government subsidy of one form or another. In England the engineering development of aviation is largely in the hands of the industries.

The United States has a better opportunity for making aviation profitable than any other country in the world, due to its great distances, and Mr. Siddeley thinks that the work of the air mail in America will prove a very successful channel for the development of the aviation industry in America.

He is under the impression that the question of body style must take a greater place in the sale of the Ameri-

## MOTOR TRUCK MAKERS PLANNING FALL SHOW

DETROIT, June 18—Directors of Motor Truck Industries, Inc., have approved a plan to hold a national motor transport show in Chicago during the fall season, details as to the time and place to be announced later. As outlined, the show will essentially be for demonstrating commercial motor vehicles in operation, and a large attendance of fleet owners, operators and dealers will be sought.

Through the initiative of the association, motor truck parades are being staged in many cities of the country with the primary purpose in view of encouraging increased use of trucks for general transportation. For the most part these are being staged by fleet owners with the cooperation of dealers. It is expected that 100 cities will hold truck parades in the next few months.

The legislative committee of the association is organizing for co-operative work with the trucking associations of the country. The association will participate through this committee in all highway activities that these truck owners' associations are interested in, and of which it is notified.

can motor car. The development of pride of ownership is a strong sales appeal, one that is being used to a very much greater extent in Europe than in America, and is largely responsible for the sale of high-class, highly finished bodies to the British public. Selling products of such character is a merchandise study, and must be given the same study and preparation as problems of design or production.

## Maker of Hatfield Car Placed in Receivership

SIDNEY, N. Y., June 16—R. W. Siver has been appointed receiver for the Cortland Cart & Carriage Co., maker of Hatfield cars, an involuntary petition in bankruptcy having been filed. The business is being continued under the receiver, and the company believes that a reorganization plan will be developed which will permit of the discharge of the receiver and the return of the property to its control.

As yet no inventory has been completed, so that a schedule of assets and liabilities has not been compiled.

### LEWIS F. CANNON DEAD

ROCK ISLAND, ILL., June 15—Lewis F. Cannon, aged 60 years, trade manager for the Rock Island Plow Co., with which he had been associated for 16 years, died at his desk from heart disease.

## Better Return Made by Stutz Last Year

Deficit of \$40,535 Reported for Period Ended Dec. 31 Against \$662,378 in 1922

INDIANAPOLIS, June 16—While the annual report of the Stutz Motor Car Co. of America as of Dec. 31, 1923, shows a net loss of \$40,535 for last year, yet it compares most favorably with 1922, which carried red ink figures of \$662,378. The Charles M. Schwab interests have worked vigorously, and the report is indicative of the success they have achieved.

Net sales increased from \$2,737,218 in 1922 to \$4,297,133, with an operating profit of \$59,986, against a loss of \$284,966 in 1922. Total income was \$74,150 against a deficit of \$278,963 in the preceding year.

Under the Schwab management, 1923 was a year of accomplishment in which sales were doubled, the dealer organization increased and the Stutz line pushed to the limit, 2373 cars being sold. President W. M. Thompson states that "the four-cylinder cars of the model sold during 1923 were sold at a substantial loss," so that the showing the company made was largely due to the six.

The company's balance sheet shows assets of \$7,409,702, including good will of \$2,100,000, and an inventory of \$1,924,122. Cash on hand of \$720,803 is reported, and surplus of \$4,531,441.

## Paige Expected to Earn \$1,800,000 in 6 Months

DETROIT, June 18—Following action by the board of directors of the Paige-Detroit Motor Car Co., at which a common stock dividend of 3 per cent was declared, President H. M. Jewett said:

The company's actual earnings for the first five months of 1924, plus the estimated earnings for June will show for the first six months a total in excess of \$1,800,000, which is equivalent to 30 per cent on the \$6,000,000 common stock outstanding.

During the first six months of 1924 more Paige and Jewett cars will be built and sold than during any previous six months in the history of the company. Every indication points to good, healthy, substantial business during the remainder of 1924.

## Reorganization Plans for Avery Progressing

PEORIA, ILL., June 18—W. T. Colean is chairman of a special committee of the Association of Commerce which is considering plan to retain the Avery Co. by new financing and reorganization in which all Peoria business interests will be involved.

Weekly meetings are said to have shown encouraging progress in the plan and the plea is made for its support as a civic enterprise and municipal duty.

## Timken Axle Limits Field of Production

### Company Decides to Discontinue Manufacturing for Low and Medium Priced Cars

DETROIT, June 17—Discontinuance by the Timken Detroit Axle Co. of further manufacture of axles for cars in the low and medium priced field was announced this week. This comes as a result of the determination of the executives to place the company upon a dividend paying basis. There is no money for a unit maker such as itself in the low and medium priced business, the company declares, and there does not promise to be under competitive conditions existing.

In cutting adrift from this line of business, the company will confine itself, so far as passenger cars are concerned, to making axles solely for manufacturers of high priced cars, of which it has a number of leading accounts and which is profitable business. Coupled with the truck and bus business, which is steadily developing, the company is preparing itself to do business only in those fields where the opportunity for profit is favorable.

#### Concentrate in One Plant

Discontinuance of its low and medium priced business means the discontinuance of the Waterloo Avenue plant and the confinement of all operations to the Clark Avenue plant. Lines which are to be continued will be transferred to the Clark Avenue plant at once and steps taken looking toward the disposition of the Waterloo plant. This will be offered for sale and sold as opportunity presents.

The company declares that the Waterloo Avenue plant has not been on a money-making basis since the war, and its continued operation has to a large extent resulted in conditions which made it impossible for the company as a whole to show a favorable return. Practically all of the business which it is now discontinuing has been carried on at this plant, so that the abandonment of the field makes it no longer necessary to keep it.

#### Not a Profitable Field

The low and medium priced car field does not offer a suitable basis of profit to the units maker, say executives, particularly under competitive conditions as they exist in the unit manufacturing fields. This is due to the fact there is too much capacity for the amount of business offered, resulting in conditions under which the legitimate parts maker cannot acquire business at a price that is favorable, it is declared.

In addition to the competitive difficulties of the parts makers' position, there is, furthermore, the condition under which he has no protection on the business he acquires. Contracts and orders are made, based upon definite shipping

## Business in Brief

*Written exclusively for AUTOMOTIVE INDUSTRIES by the Guaranty Trust Co., second largest bank in America.*

NEW YORK, June 18—The recession in business activity is still reflected in reduced operating schedules, unemployment, wage cuts, declining bank loans, low interest rates, and dull markets. Some rather striking exceptions to the general trend last week were seen in rising stock quotations and firmer commodity prices. The prices of agricultural commodities show the greatest strength.

Car loadings in the week ended May 31 (a holiday week) numbered 819,904, comparing with 918,213 in the preceding week and 932,684 in the corresponding period last year.

Despite the greatly reduced output in May, unfilled orders on the books of the United States Steel Corp. declined 580,358 tons during the month, and stood on May 31 at 3,628,089 tons, the lowest figure recorded since November, 1914. Current reports indicate that buying has been somewhat larger this month than in May.

Building contracts reported by the F. W. Dodge Corp. for 36 Eastern States in May represented a total value of \$419,272,600, 3 per cent less than in April and 13 per cent less than in May of last year.

Preliminary figures for May show exports of \$336,000,000 and imports of \$305,000,000, as against exports of \$347,000,000 and imports of \$324,000,000 in April.

Fisher's index of wholesale commodity prices stood at 143.4 last week, comparing with 143.3 in the preceding week and 159 a year ago. Bradstreet's food index stood at \$3.10, as against \$3.04 the week before and \$3.18 at this time last year.

Interest rates continued to decline last week, call money being offered freely at 2 per cent, and time loans being quoted at 3 to 3½ per cent. Federal Reserve banks of New York and Boston reduced discount rates to 3½ per cent, while the Chicago, Richmond and San Francisco Reserve banks cut down their rates from 4½ to 4 per cent.

and manufacturing schedules which cannot be worked out in a majority of cases, owing to the inability of the customer to take shipments in the quantities originally designed, and upon which the success of the contract to the parts maker is largely based.

(Continued on page 1359)

## Ford Making Study of Accessory Field

### Policy of Producing Limited Line for Dealers Awaits Ending of Investigation

DETROIT, June 17—Reports that the Ford Motor Co. is on the point of starting manufacture of a line of accessories for its cars, which are to be sold through its dealer organization, are to an extent premature, officials declare, though it is admitted that the company is not only considering such a plan, but for some time has been conducting an investigation as to the advisability of including certain items of equipment in its list of products.

The report that such action is near is due in a large degree, executives say, to the fact that recently the company has included such items as windshield wiper, door lock and rear view mirrors as standard equipment on closed models and is manufacturing this equipment itself. These items are not being sold through dealers for general sale, but to this time are only for standard equipment on the closed models.

#### Looking Up Traffic Laws

Furthermore, the investigations the company has been making as to traffic regulations in different States and the special provisions of insurance where locking equipment is included have given the impression that the company was ready to start manufacturing accessories. Probably only the fact that the investigations are not fully complete prevents making definite announcement at this time as to the company's accessory policy.

Such announcement, it is declared, will not be made within the next three months, but will be determined upon definitely following that time. Should it go in for accessory manufacture these will not include more than half a dozen items, but these will be those generally regarded as necessary for the safe operation of the car and as such the ones commonly bought.

#### Accessories in List

The list as outlined at the company offices probably would include speedometer, bumpers, steering wheel locks or lock wheels, windshield wipers, stop lights and rear view mirrors. These would be sold through all company dealers and service stations and would be built for ready installations. Cars as shipped also would be so designed as to make the installation of the accessories practically integral.

Experience of the trade has shown that in a large number of instances, if not in the majority, the sale of these items as outlined above accompanies the sale of a new car practically in the case of city business. In this way the car

(Continued on page 1358)



## Michelin Wins Suit, Wheel Patent Valid

### Federal District Court in Detroit Hands Down Decision—Ap- peal Will Be Taken

DETROIT, June 16—Under decision by Judge Tuttle in Federal District Court here, the rights of André J. Michelin as patentee and owner and of William N. Booth and the Kelsey Wheel Co., Inc., as licensees, are upheld in the suit brought by these complainants against the Hayes Wheel Co., to restrain this company from manufacturing a type of demountable rim which, it was claimed, infringed the patent.

The decision finds that the Michelin patent is valid and that it is infringed by the Hayes Wheel type. The contention of the defendant company was that the Michelin patent was invalid in that it was not original, but that the inventor had knowledge and made use of ideas embodied in former patents granted for wheels with similar demountable features. The court held, however, that the Michelin patent was the first to accomplish successfully the result sought by use of clamps.

In its defense the Hayes company listed various patents which had been granted in four countries for wheels of this type. The earliest of these in the United States dates back to Oct. 13, 1868, in which one S. Mosher was granted a patent on a box wheel. There were 18 other patents granted in the United States up to the Michelin patent, it declared, and 12 in France, 12 in England and two in Germany.

It was further declared that prior to the issuances of the Michelin patent, July 6, 1909, this type of wheel had been offered for sale in the United States for more than two years. The license to Mr. Booth and Kelsey Wheel was dated Sept. 22, 1914. The rights as exclusive patentees were contested in view of the exception of the Michelin Tire Co. from the exclusion.

#### Hayes to Appeal Decision

DETROIT, June 17—The Hayes Wheel Co. will appeal the decision as handed down in the Federal District Court here, in which the Michelin patent was upheld and the Kelsey Wheel Co., Inc., and William N. Booth were held exclusive licensees. The company will proceed with its manufacturing operations, declares President C. B. Hayes, the decision having no effect in this respect.

Lawyers for the Hayes company are proceeding with plans for the appeal, which will be carried through as rapidly as possible.

#### S. deB. KEIM IN NEW YORK

SPRINGFIELD, MASS., June 18—Announcement is made by S. deB. Keim, general sales manager of Rolls-Royce of

America, Inc., of the removal of his offices from the Springfield works to the Colonnade Building, which houses the New York branch in Fifty-eighth Street, off Broadway. This is considered a forward step in developing sales efficiency in the concentrated Eastern area. Rolls-Royce now operates branches in Boston, Cleveland, Chicago, San Francisco and Los Angeles, in addition to those in New York and Newark, N. J.

### Advertising Managers Hold Two-Day Meeting

TOLEDO, June 19—The meeting of the advertising managers of the National Automobile Chamber of Commerce convened here this morning for a two-day session, with Edward S. Jordan president of the Jordan Motor Car Co. and chairman of the advertising committee, presiding.

Features of today's program were "Keys That Unlock Advertising Secrets," by G. Lynn Sumner, advertising counsel of the International Correspondence School, and a discussion on the subject of "Helping the Dealer in Intensive Merchandising."

On the card for Friday are "What You Can Do with 2 Per Cent" by Charles Frey of Charles Daniel Frey, Inc.; "Trading Roosters for Roadsters" by Victor F. Hayden, secretary of the Agricultural Association, followed by a discussion on "How Many Farmers Will Buy Cars and Trucks in the Next Six Months." The forum for "Brass Tacks Questions and Answers" includes "Why Are There Fewer House Organs?" "Can Motion Pictures Sell Cars and Trucks?" and "Questions from the Floor."

### Merchants Best Buyers of Paiges and Jewetts

DETROIT, June 16—The Paige-Detroit Motor Car Co. reports that during the month of May merchants bought 15.8 per cent of the Paiges and Jewetts sold. Foremen, machinists and other skilled mechanics were in second place, absorbing 10 per cent of the entire retail sales of the company.

The other sales in the order of their percentages of the whole follow by classes:

Executives and Manufacturers	9.1
Building Trades	9.1
Women	7.5
Salesmen	6.7
Farmers	5.2
Physicians	4.7
Transportation, Railway, Express, etc.	4.6
Real Estate and Insurance	4.1
Clerks, Accountants, etc.	3.3
National, State and City Employees	2.5
Engineers and Architects	2.4
Hotels, Restaurants, Poolrooms, etc.	2.3
Retired	2.2
Taxi and Livery	1.8
Lawyers	1.6
Garages and Accessories	1.3
Newspapers, Printing, etc.	1.3
Teachers and Clergy	1.2
Personal Service, Barbers and Laundry	1.2
Bankers	1.1
Miscellaneous	3.0

## G.M.C. Stockholders Adopt Capital Plan

### Three Issues of Senior Securities to Be Consolidated, with Right of Exchange

NEW YORK, June 17—As expected, stockholders of the General Motors Corp., at the special meeting held in Wilmington yesterday, adopted the charter amendments proposed by the directors for the purpose of simplifying the capital structure of the corporation.

Under the new plan, as approved, the three issues of senior securities have been consolidated into one issue of 7 per cent preferred stock, which will constitute a prior preference on the entire assets, after debts, of the corporation.

The holders of the present 6 per cent preferred and 6 per cent debenture stocks will be given the right to exchange their shares for the 7 per cent preferred stock on the payment of \$10 per share in cash.

The present 7 per cent debenture certificates may be exchanged for the 7 per cent preferred stock on a share for share basis without cash payment. Exchanges may be made before Dec. 31, 1924.

The charter amendments also provide for the exchange of the present outstanding common shares for new common shares on the basis of one new common share for each four shares of present common stock outstanding, thus reducing the 20,646,400 common shares at present outstanding to 5,161,600 shares.

#### Present Capital Position

The corporation states that as of March 31, 1924, its capital position is:

329,316 shares of 7 per cent debenture stock	\$ 32,931,600
608,010 shares of 6 per cent debenture stock	60,801,000
161,834 shares of 6 per cent preferred stock	16,183,400
20,646,397 shares of common stock without par value carried at \$10 a share	206,463,970
Surplus	132,176,118

Total .....\$448,556,083

Upon completion of exchanges of all securities (if all are exchanged) the capital stock position based on March 31, 1924, statement may be summarized as follows:

1,099,160 shares of 7 per cent preferred stock	\$109,916,000
5,161,600 shares of common stock without par value, capitalized at \$50 per share	258,080,000
Surplus	88,258,523

Total .....\$456,254,523

#### CHRYSLER PHAETON HIGHER

DETROIT, June 16—Following the recent announcement of a \$100 price advance on all Chrysler models except the phaeton model, the company now lists the latter at \$1,395, an increase of \$60 over the old price.

## Yellow Sleeve-Valve to Make New Engine

Development Is Now Under Way  
—Expected That Production  
Will Begin in Fall

EAST MOLINE, ILL., June 18—A more powerful engine is being developed at the plant of the Yellow Sleeve-Valve Engine Works, Inc., here, production on which is scheduled to begin in the fall.

Arrangement of machinery to expedite production is already under way, and although the gradual extension of the plant is contemplated, there will be no increase of working forces at this time. A complete heat-treating department, marking an important step in perfecting engine manufacture, has been installed.

The new engine, it is reported, will be designed for requirements of the cross-country bus haul.

A. H. Putnam, company consulting metallurgist, is in charge of the heat-treating department operation, which is equipped to handle the varying number of treatments for the production of sleeve-valve engines and maintenance and manufacture of tools. Emery Davidson, mechanic specialist, is foreman of the department.

## Willys-Overland Builds New \$650 Business Coupe

TOLEDO, June 16—The Willys-Overland Co. announces a new two-passenger business coupe on the Overland chassis, to sell at \$650, f.o.b. Toledo. The body is of the usual coupe type of standard construction and 14 coat finish. The doors are unusually wide, giving a clear opening 31½ in. and are substantially mounted on four hinges.

The interior is trimmed in durable long-grained Spanish upholstery. Exceptional room is provided for both driver and passenger, the inside width of the body being just under 4 ft., while the distance between steering wheel and seat back is more than 15 in.

A large storage space with weather-tight cover provided with a lock is available under the rear deck. Sun visor and window regulators are standard equipment. This body is mounted on the regular chassis, with 106 in. wheelbase and 30 x 3½ in. tires as regular equipment. Deliveries have already started on the new model.

### CHAIN BELT ELECTION

MILWAUKEE, June 18—J. C. Merwin, works manager of the Chain Belt Co., has been elected second vice-president, while other changes made at the annual meeting included the election of Brinton Welsch as secretary and C. E. Stone as assistant secretary. The latter is assistant to the president and has also been purchasing agent since 1918.

## FORD BUILDS MILLION CARS IN FIVE MONTHS

DETROIT, June 18—From taking slightly over six years to build its first million cars, Ford Motor Co. business has grown to a point where its most recent million, the tenth, was built in slightly more than five months. The production record of the company by millions, from the time the first model T car was built, Oct. 1, 1908, is as follows:

Car No.	Date
1.....	Oct. 1, 1908
1,000,000.....	Dec. 10, 1915
2,000,000.....	June 14, 1917
3,000,000.....	April 2, 1919
4,000,000.....	May 11, 1920
5,000,000.....	May 28, 1921
6,000,000.....	May 18, 1922
7,000,000.....	Jan. 12, 1923
8,000,000.....	July 11, 1923
9,000,000.....	Dec. 26, 1923
10,000,000.....	June 4, 1924

Officers reelected were: C. R. Messinger, president; Clifford F. Messinger, first vice-president, and C. L. Pfeifer, treasurer.

## Cadillac Adds Landau Listing It at \$3,650

DETROIT, MICH., June 16—A new five-passenger landau, priced at \$3,650, has been added to the Cadillac line, bringing the number of body styles up to fourteen. The new body is finished in green with a French gray belt-line stripe, the wheels being in natural wood. Headlamps, side lamps, hub caps and radiator shell are nicked.

The rear quarter has coach bows and oval windows set at a slight angle from the vertical. All windows and doors in the tonneau are equipped with silk roller shades. The upholstery is mohair velvet harmonizing in color with the exterior finish.

## Turner Tractor Parts Manufacture Resumed

MILWAUKEE, June 16—The manufacture of Simplicity gas engines and parts for the Turner-Simplicity tractor, previously made at Port Washington, Wis., by the former Turner Manufacturing Co., has been resumed in a new plant at Cedarburg, Wis., by a new concern, the Turner-Simplicity Co., of which L. M. Turner is vice-president and general manager.

The engine is made as a portable farm unit and for application to contractors' equipment, mixers and other purposes. For the present no attempt will be made to resume production of Turner tractors, although this is in prospect as soon as conditions respecting agriculture become more favorable.

## St. Louis Rail Line May Buy Bus System

John Hertz States He Is Willing  
to Sell His Holdings in  
People's Motorbus Co.

ST. LOUIS, June 18—It has been announced here that John Hertz of Chicago, who holds 35,000 shares of Preferred A and 21,000 shares of Preferred B stock of the People's Motorbus Co. of St. Louis, has agreed to sell his stock to the reorganizers of the United Railways Co. of St. Louis, if the remaining 14,000 shares, held by associates, are purchased under terms that will prove agreeable to them.

It has been the contention of J. K. Newman, in charge of the reorganization, that it would be impossible for the Motorbus company and the United Railways to operate independently of each other and at the same time for the United Railways to reduce fares and still make a profit.

Mr. Newman has said that if the United Railways owned the bus lines they could be used to augment the street car service and not compete with it. In other words, people who preferred to pay a higher fare for riding on the buses should be able to do so, and at the same time the revenue would not be taken away from the street car company as it is under present conditions.

### Seek Profitable Operation

It was said recently by Mr. Newman that, should the United Railways Co. be successful in purchasing the bus lines, it would not be for the purpose of putting them out of business, but to operate them at a profit for the benefit of the United Railways.

As far as is known the bus company has been doing a profitable business, and the United Railways is and has been for years in the hands of a receiver and it is only now that efforts are being made to put the company on a paying basis, it is said.

Mr. Newman said, "If the people want to pay 10 cents for a ride (3 cents higher than the street car fare of 7 cents), they will have the bus line, and it would be foolish from every standpoint for us to discontinue a profitable business in the interest of one that is struggling for an existence."

The market value of Mr. Hertz' stock is \$2,000,000.

### AMERICAN BOSCH SALES

SPRINGFIELD, MASS., June 17—A. H. Bartsch, general sales manager of the American Bosch Magneto Co., reports a 15 per cent increase for this last May over May, 1923, and an 18 per cent gain for April over the preceding April. An average of approximately 26 per cent increase has been reported for the first five months of the year, as compared with the same period in 1923.



## Tuscora Plant Sold to New Hawk Rubber

Latter Has Been Producing Balloon Tires Through Small Company in Akron

AKRON, June 18—The Tuscora Rubber Co. plant at Dover, which has been in the hands of a receiver and not in operation for several months, has been sold to the recently formed Hawk Rubber Co., according to Attorney Willis Bacon and Henry Hawk, president of the new company.

The purchase price has not been announced, nor has any statement been made by the receiver regarding payments to creditors.

The new company several months ago started production of new balloon tires through another small manufacturing company in Akron and, therefore, has completed its experimental work, although production of tires will probably be delayed while the plant is devoted for the time being to the production of mechanical goods and sundries.

The company will be financed, according to Mr. Hawk, through the sale of 25,000 shares of no par common stock, although as far as can be learned now, no bonds or preferred stock will be issued against the plant. Mr. Hawk stated recently that the financing has been practically completed.

The Tuscora plant was placed in receivership after more than a year of financial difficulties. At one time the business men of New Philadelphia made efforts to raise funds for continuing operations, but this plan did not meet with success.

Mr. Hawk was formerly general manager of the American Rubber Co. of Akron, and resigned slightly more than a year ago. The names of the officials of the new company have not been announced.

### India Tire Breaks Records

The India Tire & Rubber Co. announces that the business for the last three months has broken all previous records in the company's history, business during the period being more than 100 per cent greater than for the corresponding quarter last year.

Production is at capacity and has been for the entire year thus far, with daily output fluctuating between 850 and 900 tires a day.

Announcement is also made that regular common dividend of \$1 a share and 50 cents a share additional has been declared, in addition to the regular preferred dividend. Dividends are payable July 1 to stockholders of record June 20.

### Goodrich to Take Inventory

While official announcements are lacking, it has been learned that the B. F. Goodrich Co.'s shutdown for inventory

## WILMER GOES ABROAD; SEES BALLOON GROWTH

NEW YORK, June 16—Before sailing for Europe on the Olympic, E. G. Wilmer, chairman of the board of the Goodyear Tire & Rubber Co., predicted that next year 50 per cent of the cars will be equipped with balloon tires, which will gradually replace the high pressure casing.

Mr. Wilmer is not at all alarmed because of the temporary lull in tire production, believing that the automobile manufacturers will live up to their original contracts.

purposes during the first part of the coming month will be limited to one week for the factory as a whole, although the company plans to close some of its departments for at least two weeks.

It is believed that the first half year statement, which will be issued after inventory is taken and books are closed, will show improvement in the company's earnings as compared with corresponding periods of the last three years. This will be due to the stringent economies which have been introduced in production and selling.

The company is reported to be making in excess of 18,000 tires a day at the present time.

## Nearly \$50 Share Earned by Fisher Ohio Body Co.

CLEVELAND, June 18—The Fisher Ohio Body Co. reports net earnings for the year ended April 30, 1924, of \$4,600,000, or nearly \$50 a share on 91,350 shares of 8 per cent preferred stock. This compares with \$3,046,215 for 1923. It is a new record for the company.

The Ohio company reported on April 30 a surplus of \$7,318,531, and out of this back dividends on preferred stock running from April, 1920, to Jan. 30, 1922, and totaling \$1,800,000 were repaid to the parent company, the Fisher Body Corp., which had advanced the money. This, with \$755,600 in dividends paid for the year ended April 30, reduced the surplus to \$4,763,931.

The Fisher Body Corp. owns about 98 per cent of the common stock of the corporation.

### FORD CAR STARTS LONG TOUR

NEW YORK, June 16—J. N. Gunn, president of the Lincoln Highway Association, officially started the 10,000,000th Ford on its transcontinental trip today from Times Square. Frank Kulick, veteran race driver, is pilot of the Ford, which will follow the Lincoln Highway to the Pacific Coast. Starting with Kulick was Gilbert Hoag, field secretary of the Lincoln Highway Association, in his Packard.

## Promotion of Comet Brings Indictments

Federal Grand Jury Charges That  
Mails Were Being Used  
Fraudulently

SPRINGFIELD, ILL., June 14—Eight former officers, salesmen and members of the reorganization committee of the Comet Automobile Co., defunct, of Decatur, Ill., were indicted by the Federal Grand Jury this week on charges of using the mails to defraud. Stockholders are alleged to have lost \$2,500,000 through the manipulations of the Comet company and the reorganization plan in which prior stockholders were invited to contribute \$2.50 a share each to reestablish the company.

George W. Jagers, president of the company; Robert W. Jones, who was a receiver for the company in its insolvency proceedings; R. W. Nickerson, S. T. Keisacker and S. B. Rubenstein are held on five counts for using mails to defraud and the second indictment listed the reorganization committee which included Mr. Jagers, John A. Scribbens, Irving Cowles, R. W. Jones and C. E. Uhler.

### Mentioned Likely Output

The indictment against the first group cites that the Comet promoters held out that the plant would soon be manufacturing 40 cars, trucks and tractors daily and that it would produce from 3000 to 10,000 cars yearly; that it made a false claim of having paid a 20 per cent dividend; that it promised that \$10 stock then offered would be selling soon at \$17.50 and that it had made arrangements with a Philadelphia firm to take its surplus at \$22.50. It is charged that money received from subscribers did not go into the company treasury.

The Comet company was organized in Rockford, Ill., in 1916 with \$2,500,000 capital stock as a Delaware corporation and located in Decatur, where a plant was erected on a 20-acre tract. The first "Decatur-made" car was exhibited July 19, 1917 and the company pushed vigorously ahead and was selling over a wide area.

### Warning Previously Given

In December of that year a buyer of a car went into the Chicago courts and Judge K. M. Landis dismissed a suit for lack of authority but warned the officers they were treading on dangerous grounds in their mail campaign. A Federal reserve bank ruling prohibiting advance of money to dealers on bills of lading caught the Comet with \$300,000 tied up and this brought on a crisis which grew from month to month.

There were changes in the executive personnel but without success until Sept. 16, 1922, the company went into a receivership with Robert W. Jones and the Milliken Trust Co., receivers.

## Men of the Industry and What They Are Doing

### Erskine Made LL.D.

The University of Notre Dame du Lac, South Bend, Ind., at its commencement exercises conferred the honorary degree of doctor of laws upon A. R. Erskine, president of the Studebaker Corp. Mr. Erskine for the last three years has been president of the Board of Lay Trustees of the university.

### Beaton Becomes Sales Manager

Following the retirement of G. W. McLaughlin as vice-president and general sales manager of General Motors of Canada, J. H. Beaton has been appointed general sales manager, and C. E. McTavish general parts and service manager. K. T. Keller, formerly manager of production of the Chevrolet Motor Co., who some time ago was made general manager of General Motors of Canada, has been appointed vice-president, reporting to R. S. McLaughlin, president.

### Deweese Opens Offices

A. H. Deweese, formerly assistant purchasing manager of the Packard Motor Car Co., purchasing manager of the Saxon Motor Corp. and for the last few years identified with the United States Asbestos Co. in the East, has opened offices in the Free Press Building, Detroit, and the Swetland Building, Cleveland, for the handling of brake lining and other products of the United States Asbestos Co.

### Join Stoughton Wagon Staff

Kenneth C. Plasterer, formerly works manager, and W. C. Buser, formerly service manager and assistant director of sales of the Midwest Engine Co., Indianapolis, have joined the staff of the Stoughton Wagon Co., Stoughton, Wis., manufacturer of motor trucks and buses. The Stoughton company used Midwest engines, and when the Indianapolis business was sold recently, acquiring tools and manufacturing rights to three types of the Midwest design, together with materials and parts for about 200 engines.

### E. H. Shepard Resigns

E. H. Shepard has resigned as general sales manager of the Holley Carburetor Co. and has not announced his plans for future activity. He is well known in the industry and has been connected with the manufacture and sale of carburetors for more than fourteen years.

### Mickelsons with Distributor

The Lohr Auto Co., Hartford, Wis., an extensive distributor of Ford and Fordson, has announced the acquisition as stockholders of Otto Mickelson, formerly chief engineer and works manager of the Milwaukee engine plant of the Avery Co., Peoria, and his brother, Her-

man R. Mickelson, secretary and sales manager, Wisconsin Motor Manufacturing Co., Milwaukee, who will become active in the business with Charles H. Lohr. The concern will incorporate at once. In 1923 it ranked third among Wisconsin dealers in the sale of Ford tractors and equipment and high in Ford car sales.

### Adams Represents Biflex

Floyd W. Adams has been engaged as special factory representative of the Biflex Products Co. of Waukegan, Ill. For the last six years he has been connected with the Victor Manufacturing & Casket Co. in a similar capacity in Michigan, Indiana, Ohio, New York and Pennsylvania.

### Westcott Gives All Time to Company

B. J. Westcott, president of the Westcott Motor Car Co., Springfield, Ohio, has resigned as treasurer of the American Seeding Machine Co. so that he can give all of his time to the business of the automobile company. His resignation is effective June 30.

### Lord & Thomas Appoints Willman

George L. Willman, for the last four years vice-president and general sales manager of the John G. Wollaeger Co., Milwaukee, distributor of the Studebaker, has resigned to become associated with Lord & Thomas, Chicago. In his new connection Mr. Willman will have complete charge of the Studebaker advertising account. He was associated with the Studebaker factory sales executive department prior to joining the Wollaeger company.

### Stewart-Warner Acquires Vacuum Tank Patents

CHICAGO, June 19—Official confirmation of long circulated rumors that the Stewart-Warner Speedometer Corp. of Chicago has been negotiating for the acquirement of other vacuum tank rights was had today at the company's headquarters.

It is announced that the corporation has arranged to take over the patents of Gorzia & Gorzia (Zorzi) under which the G. G. vacuum tanks have been made. While details of the purchase are yet to be worked out, it is said that the manufacturing will likely be conducted in Chicago. Whether the name will be changed is another detail not yet settled.

### REO TO CLOSE FOR VACATION

LANSING, MICH., June 17—The Reo Motor Car Co. will close for the annual vacation of two weeks July 4.

## Neal G. Adair Joins Staff of M.A.M.A.

### Resigns as Editor of Motor World and Is Succeeded by A. V. Comings

NEW YORK, June 19—Neal G. Adair, who has been editor of *Motor World* for the last four years, has resigned and will join the staff of the Motor and Accessory Manufacturers Association on July 1, becoming manager of the Show Department.

A. V. Comings, lately editor of the *Automobile Trade Journal* and prior to that field editor for Chilton publications for several years, will succeed Mr. Adair as editor of *Motor World*. David Beecroft, chairman of the Advisory Committee of the Class Journal and Chilton companies, besides continuing in that capacity, will take editorial charge of the *Automobile Trade Journal*.

Mr. Adair's new work with the Motor and Accessory Manufacturers Association will include supervision of the educational activities and publicity of the association, in addition to the management of the Show Department, according to M. L. Heminway.

Previous to his connection with the Class Journal Co., Mr. Adair was engaged in newspaper work for some twelve years, having been editor of a New Jersey newspaper and an editor on the headquarters staff of the Associated Press at New York. For several years since his connection with the Class Journal Co., he has been executive secretary of the National Association of Automobile Show and Association Managers, which includes in its membership most of the large city dealers' associations conducting automobile shows.

### Jordan Awarded Prize for Best Advertising

NEW YORK, June 18—The \$1,000 prize offered by *Field and Stream* magazine for the most effective advertising built on an out-of-doors appeal, published in a national periodical during 1923, has been awarded to Edward S. Jordan, president of the Jordan Motor Car Co.

"In choosing yours," wrote the publisher in a letter to Mr. Jordan, "we feel that we have paid a deserved compliment to advertising that strikes a refreshing and original note, that is daringly vigorous and successfully appealing; in its spirit, that surrounds its product with an atmosphere of selling effectiveness that makes a mechanical contrivance breathe with a vivid personality—that, in a word, possesses unique selling force."



## Maxwell Credit Plan Removes Dealer Risk

New Financing Arrangement with  
Baltimore Company to Be  
Used in Time Sales

DETROIT, June 18—Through an arrangement which Maxwell Motor Corp. has made with the Commercial Credit Co. of Baltimore, its dealers will have the advantage of a "no liability to dealer plan" in promoting time sales of Maxwell cars.

This plan will be used in conjunction with the "repurchase plan" under which dealers have been operating, the new plan merely affording an additional optional plan of financing which dealers may use.

### Assumes All Obligations

Under the "no liability to dealer plan," the finance company assumes all obligation for the collection of time payments following the delivery of the car. If the car is to be repossessed the finance company takes care of this and resells it, the dealer having no responsibility after the car leaves his floor.

The particular significance of the plan to the industry is that it removes the element of dealer responsibility in making time sales, and makes the car itself full security for the carrying through of the deal by the time purchaser.

To the Maxwell corporation the arrangement of the plan means the endorsement of the Maxwell car, and its acceptance, as a staple of merchandise, having definite intrinsic and market value, and subject to ready and profitable sale in the open market.

This indorsement of the Maxwell car is accentuated by the fact that the "no liability" plan does not apply to the Chrysler car—as, yet, the resale value of this affiliated car being yet to be demonstrated for the reason that it has not been on the market long enough to have appeared on the resale market. Though this may be regarded as largely a matter of form, nevertheless it indicates the careful study of market values and conditions made by the finance company before undertaking this form of financing.

### Dealer Merely Makes Sale

The direct effect of this plan upon retail sales is that no business will be rejected by the finance company because of dissatisfaction over the credit standing of any particular dealer, and his ability to reimburse the finance company in the event that the buyer does not carry through the deal. This may occur under plans which embody recourse features but is entirely eliminated under the "no liability" plan. The dealer is simply not a part of the picture following his making of the sale and the acceptance of the risk by the finance company.

Where recourse clauses are operative

any dealer at certain times may be placed in position where his ability to perform his part in the repossession of a car may be somewhat questionable, and, ordinarily, he would be severely handicapped for a period at least in carrying on his business. Under this plan the standing of the dealer cannot be questioned because the car itself stands as the sole and only security where recourse may have to be obtained.

In the opinion of Maxwell executives, the "no liability" plan, in addition to its specific application and effect in closing up one of the gaps in the general financing of car sales on time payment plans, marks a changing attitude on the part of finance companies toward the possibilities of expanding their service to the industry as a whole.

Experience has demonstrated that time payment plans are more a matter of collections than of credits and that there is practically no risk at all involved where the matter of collections receive proper attention. The credit companies, knowing this, have perfected their organizations along collection lines so that they are in position today to give much better service than at any time in the history of time payment sales.

Under the methods of operation now in effect time payments must be made when due. Buyers do not have an opportunity to use cars several months beyond the time payments are due so that depreciation is not extensive. Dealers operating under recourse or repurchase plans are not faced with the problem of getting their money out of a car that has been severely used.

### Plan for Making Payments

Schedules have been worked out for Maxwell dealers under the "no liability" plan, by which cars are sold on down payments of one-third, 40 per cent or 50 per cent in cash. The balance may be spread out over six, eight, ten or 12 months. The plan provides for insurance during the time the contract is in existence, this being included in the carrying charge as in all time payment plans.

The Commercial Credit Co. of Baltimore, with which the "no liability" plan has been worked out, is one of the largest of the automobile financing companies. Affiliated with it are the Commercial Credit Corp., New York; Commercial Credit Trust, Chicago; Commercial Credit Co., San Francisco, and Commercial Credit Co., Inc., New Orleans. Each of these is a subsidiary operating in the several territories in which they are located. Their combined resources are \$66,000,000.

### MOTOR WHEEL VACATION PERIOD

DETROIT, June 14—Motor Wheel Corp. will close its factory today for a vacation period which will extend over to July 7. Everyone in the plants will be on vacation at the same time except executives and men necessary to do general work in the shops. There will be about 1500 men including the production divisions and administrative forces under vacation at the same time.

## Simms Will Continue Under Receivership

President Is One of Two Receivers Named—Bank Creditor Expresses Confidence

NEWARK, N. J., June 17—The Simms Magneto Co., maker of automotive products and home lighting systems, is in receivership, Vice-Chancellor Backes having named Richard C. Anderson, president of the company, and M. Casewell Agine, receivers, with orders to continue operations.

An estimate places the assets at \$2,300,000, with liabilities of \$1,260,000 and at the present time the receivers are preparing a detailed report to be submitted to the court as to the outlook.

It is stated that the company has been running at a loss for the last three years, but one of the company's biggest creditors, the Mechanics & Metals National Bank, holder of \$575,000 worth of notes, is reported to have stated through its counsel, that it has every confidence in the present management.

The Simms Magneto Co. was incorporated in New Jersey April 24, 1917, as successor to a New York corporation of the same name. It was capitalized at \$1,000,000 common and \$1,000,000 7 per cent cumulative preferred. Its plant is located on about three acres lying across the boundary line of East Orange and Bloomfield and consists of a group of seven connecting buildings of reinforced concrete and brick construction, mainly four stories and all fireproof.

Officers of the company are: Richard C. Anderson, president; Charles Hayden, vice-president; A. A. Fisher, secretary and treasurer. Directors: The above and C. S. Bragg, Floyd M. Smith, W. R. Craig, Fergus Reid, Charles Slaughter and Charles H. Ferguson.

## Reconstruction Planned by English Dunlop Rubber

LONDON, June 8 (by mail)—It is reported that the delay in the issue of the report and balance sheet of the Dunlop Rubber Co. for the 18 months ended Dec. 31 last will shortly be concluded and that a plan of capital reorganization will be made known when the report appears.

The company sustained a heavy loss, amounting to more than £7,000,000, in one year during the slump period, while its last published balance sheet showed a debit balance of nearly 7¼ million sterling.

It is expected that the present board of management, which was not responsible for the loss in question but has succeeded in straightening out the Dunlop finances and reorganizing the manufacturing and sales organization, will suggest that something like £10,000,000 capital should be written off, which would approximate half of the total capital.

## Liability Insurance Views Being Sought

### Questionnaire Sent Associations to Obtain Attitude on Com- pulsory Feature

NEW YORK, June 18—In the opinion of the Motor Vehicle Conference Committee compulsory liability insurance for every owner of a motor vehicle will be one of the chief automobile subjects discussed by the 42 State legislatures which meet next year.

With an open mind in the matter and desiring to get the consensus of opinion of those on whom such a tax would fall, the committee, through Secretary Russell Huffman, is sending out a questionnaire to all automobile dealers' associations and owners' organizations. Five questions are asked, as follows:

1. Has your club or association taken any stand on compulsory automobile liability insurance?
2. If in favor of such insurance, how much, in your opinion, should the amount of the minimum liability under such policy of compulsory insurance be?
3. Should this insurance be written or issued by
  - (a) existing private insurance companies,
  - (b) by the State,
  - (c) mutual companies organized for that purpose,
  - (d) or by all of them?
4. Do you think compulsory insurance will
  - (a) reduce the number of motor vehicle accidents, or
  - (b) increase the number of accidents by making the driver more careless?
5. What is your opinion of a plan of insurance which will operate similar to workmen's compensation insurance?

Mr. Huffman also attaches arguments for and against such legislation as they have come to the committee. As outlined they are:

#### A

Proponents say: That it will reduce the number of accidents on the highways by making the driver more careful.

Opponents say: That it will not reduce the number of accidents, but rather will increase them because it will have a tendency to make every driver more careless.

#### B

Proponents say: That it will insure compensation for injury to persons or damages to property from car owners otherwise irresponsible.

Opponents say: That drivers would be much more careful if no one were allowed to carry insurance, or if only co-insurance was permitted—that is, the owner assuming part of the loss.

#### C

Proponents say: That it will insure compensation to the wife, children and other dependents for injuries to or death of the husband or chief means of support, from the car owner who is judgment proof.

Opponents say: That the best way to reduce the number of accidents is to strictly enforce the already existing traffic laws and regulations.

Proponents say: That the cost of such insurance would not operate as a burden on the motor vehicle users, as the cost could be kept at a minimum by the State undertaking to issue such insurance.

Opponents say: That, assuming the lowest estimate, the cost of such insurance will add \$450,000,000 annually to the cost of operating motor vehicles in the United States.

Opponents have two other arguments. One is "that the amount of uncompensated loss for which this expense would be entailed is unknown and should be determined before undertaking compulsory insurance." The second is that there is no assurance that the rates will be kept at a minimum.

While a majority of legislatures last year considered bills calling for compulsory insurance for every owner of a motor vehicle, not one of the measures was enacted into a law. There are 19 States, however, that require bonds or liability insurance from motor vehicle common carriers.

It is estimated that not more than one-third of the owners in the United States carry liability insurance at the present time.

### S. F. Bowser's Business Above \$1,000,000 in May

FORT WAYNE, IND., June 18—S. F. Bowser & Co., manufacturer of pumps, tanks and various filling station equipment, announces the completion of a new building at San Francisco which hereafter will house the Pacific Coast branch of the company. The building has about 20,000 sq. ft. of floor space.

Officials of the company also announce that the company's business in May exceeded \$1,000,000, the second month this year in which that figure was passed. The other month was April. Total business for the year to date was said to be more than \$500,000 greater than for the corresponding period last year, when all records were broken.

The aggressive sales policy of this company is being continued.

### Three-Seated French Car Invades Canary Islands

WASHINGTON, June 19—Supremacy of a car of well-known American make is menaced in the Canary Islands by a small three-seated French car of 6 hp. selling for 14,500 francs, c.i.f., and ready to run, at the purchaser's garage, American Consul Julian C. Greenup at Las Palmas cables the Automotive Division of the Department of Commerce.

The dispatch says that about 60 of these cars have invaded the market with much success.

Success of the French car is attributed to newspaper advertising, posters, and the presence in Las Palmas of one of the company's expert mechanics who keeps the cars in good running condition. Economy of operation forms the principal sales argument.

## Safety Committees to Meet This Month

### Three Meetings So Far Scheduled Under the Direction of Secre- tary Hoover

WASHINGTON, June 18—Brisk activity on the part of important committees of the Conference on Street and Highway Safety, which is being sponsored by Secretary of Commerce Hoover, is forecast in the announcement that numerous meetings of the committees will be held this month.

Dates for meetings of three committees have already been set as follows: June 20, Traffic Control; June 24, City Planning and Zoning, and July 11, Statistics.

Initial steps for securing information upon which measures may be based for the improvement of highway and street traffic safety were taken this week, when Mr. Hoover met with members of the Committee on Statistics. One outcome of this meeting was that the Secretary is asking the cooperation of the secretaries of State in supplying facts on State legislation in force as regards the reporting of street and highway accidents.

#### Work of Statistics Committee

The Committee on Statistics, the chairman of which is W. M. Steuart of the Census Bureau, is seeking, under Mr. Hoover's direction, to discover all present sources of data as to the street and highway accidents, with particular attention to location, type, frequency, severity and causes.

This information will be used by the committee in presentation of conclusions and a detailed plan for the future uniform reporting of accidents and the most effective use of data collected. It will also be used by other committees which are making studies for presentation at the Conference on Street and Highway Safety to be held in the fall.

The Committee on Statistics was the first to be formed in connection with Mr. Hoover's efforts to secure the coordination and cooperation of a number of national organizations in lessening the present hazards of traffic.

#### To Discuss City Planning

F. A. Delano, who is chairman of the Committee on City Planning and Zoning, announces that at the meeting on June 24 the study of such problems as arterial highways, street layouts, relation of bulk of buildings to density of traffic, location of public buildings, playgrounds and other factors entering into the safety problem will be taken up.

At the initial meeting of the Traffic Control Committee on June 20, headed by Major Roy F. Britton, president of the Automobile Club of Missouri, question of traffic laws, etc.



## Race at Altoona Won by Murphy in Miller

### Rain Interferes with Event and Finally Prevents All but Six Cars Finishing

ALTOONA, PA., June 14—Jimmy Murphy, 1922 A. A. A. champion and runner-up among the drivers in 1923, won the Flag Day international 250-mile classic over the Altoona speedway mile-and-a-quarter bowl today, leading a field of sixteen starters, which included the first place winners at the Memorial Day Indianapolis race.

Rain interfered with the race program, a shower wetting the track when the drivers were making their 100th lap. The race was not held up, although drivers slowed down.

Only six cars finished when a rain-storm broke across the bowl, causing the balance to be flagged. All were placed in money positions, according to the finish.

#### Wonderlich in Accident

Four cars were forced out of the race due to engine troubles, with a fifth car, that of Jerry Wonderlich, wrecked in the 159th lap when the right rear tire blew out, the car turning several somersaults on the high banked curve and landing upside down in the ditch. Wonderlich sustained a severe concussion of the brain and fracture of the left ankle. He will recover.

The race was the first for Murphy in Altoona since the opening of the big bowl. He started away in next to the pole position and three times during the 250 miles was in first place. He went to the lead from the 11th to 17th laps and again got back in the lead for a lap in the 95th lap. At the 99th lap he went into first place, holding the lead until the finish.

At one time during the last half of the race, Murphy in a Miller Special, Fred Comer in a Durant and Antoine Mourre in a Mourre Special raced several laps only 2/5 of a second separating the first three cars.

#### Murphy in Pits Once

Murphy was in the pits but once during the race, going in on the 21st lap to change a right front tire, the change setting a new world's record, the official time being announced as 8 4/5 seconds.

Seven different cars were in first place at one time or another during the race. Forty-two times were cars forced to the pits, mostly on tire troubles, right front tires going bad.

#### The official summary follows:

First—Jimmy Murphy, Miller special, time 2 hours, 10 minutes, 57 seconds, average 114.7 m.p.h., beating the Altoona track record of 111.6 m.p.h. made Labor Day, 1923, by Eddie Hearne in a 200 mile race.

Second—Fred Comer, Durant, time 2 hours, 12 minutes, 36 seconds.

Third—Antoine Mourre, Mourre Special, time 2 hours, 13 minutes, 58 seconds.

Fourth—Robert McDonogh, Miller Special, time 2 hours, 15 minutes.

Fifth—Harry Hartz, Durant Special, time 2 hours, 15 minutes, 10 seconds.

Sixth—Earl Cooper (Louis Wilson, relief driver), 2 hours, 15 minutes, 20 seconds.

Seventh—Tommy Milton, flagged by rain on 198th lap.

Eighth—L. L. Corum, Duesenberg, flagged 195th lap by rain.

Ninth—Ira Vail, Vail Special, flagged 189th lap by rain.

Tenth—Ernie Ansterberg, Duesenberg, flagged 188th lap by rain.

Eleventh—Wade Morton, Miller Special, flagged 184th lap.

Frank Elliott, Miller Special, forced out, defective ignition, 49th lap; Peter Depaolo, Duesenberg, forced out 57th lap, broken shaft; Joe Boyer, Duesenberg, out 153rd lap, engine trouble; Bennie Hill, Miller, forced out 149th lap, broken gas line; Jerry Wonderlich, Durant; forced out 159th lap, tire puncture and car wrecked.

## Shipments to Argentine Aggregate 3300 Monthly

WASHINGTON, June 16—With passenger cars entering the Argentine at the rate of more than 3300 a month, 1924 promises to be the best year in the history of Argentine automobile trade, Assistant Trade Commissioner Sherwood H. Avery at Buenos Aires advises the Automotive Division of the Department of Commerce.

Mr. Avery says that this figure includes cars assembled in local plants of American manufacturers, and that about 97 per cent of the total is of American origin. During the first four months of 1924, ships' manifests showed 13,296 cars entering the country, including local assemblies.

According to official import statistics and the sales records of cars entering the country knocked down, a total of 145,459 automobiles have been imported since 1910. The number of passenger cars now in use in the Republic is estimated at 87,275.

## Tax Law in Minnesota Is Held Constitutional

MINNEAPOLIS, June 18—It is constitutional for Minnesota to tax motor vehicles used on streets and highways in lieu of a personal property tax, the State Supreme Court holds. The State brought action for collection of taxes on an automobile damaged in August, 1921, and stored on the owner's farm in 1922. The owner asked to have the car taxed as personal property instead of under the automobile tax law.

Judge Andrew Grindeland of the Kittson district court that the owner need not pay the automobile tax. The Supreme Court reversed the lower court and ordered payment of the automobile tax and ruled that "the tax imposed by the fact is not a privilege tax but a tax on property."

The legislature had power to classify motor vehicles for future taxation on the basis of prior registration and use of highways.

## Reservations Made for S. A. E. Meeting

### Company Representation at Spring Lake Sessions Will Be as Great as Last Year

NEW YORK, June 17—So far as humanly possible, all arrangements have been made for the summer meeting of the Society of Automotive Engineers, which will be held at Spring Lake, N. J., next week. Reservations made so far indicate representation on the part of as many companies as last year, although in most cases the number of individuals has been lessened because of business conditions.

As before, the four-day meeting will be devoted to professional, social and recreational activities, with five technical sessions, the semi-annual meeting of the Society and a meeting of the Standards Committee constituting the professional program.

#### Usual Athletic Features

There will be the usual sporting events open to the competition of members, such as golf, tennis and swimming. The convention will open on Tuesday and wind up Friday night with the big dinner, instead of carrying over to Saturday, as heretofore.

The engineers will use three hotels this year, the Warren having been added to the Essex and Sussex and Monmouth Hotels which housed the members in 1923.

The Daily S. A. E. will be published this year by the Prest-O-Lite Co., under direction of Frank L. Parrill. Another feature to be repeated is the motor bus service between New York and Spring Lake, the International Motor Co. having again agreed to provide and operate a fleet of Mack buses, which will leave the New York office of the S. A. E. Monday afternoon, June 23.

#### Four Topics on Program

The technical program will contain four topics of current interest—crank-case-oil dilution, air-cleaners, new developments in transmissions and riding quality. These keynote discussions will be handled by leading authorities. Neil MacCull and A. Ludlow Clayden are two lubrication engineers who will present papers on contamination of crank-case oil. In addition Ralph L. Skinner will describe a device which distills water and kerosene from the lubricating oil, while a member of the Bureau of Standards staff will give the results of investigations of oil dilution causes made during the last few months.

So important does the S. A. E. regard the air-cleaner problem that it is bringing from the Pacific Coast A. H. Hoffman of the University of California, who has made an extensive study of the subject as applied to automobiles,

(Continued on page 1360)

## G.M.C. Will Publish Its Delivery Totals

Monthly Figures Aimed to Show  
the Actual Condition Existing  
in Retail Field

NEW YORK, June 17—Actual delivery of General Motors cars and trucks to consumers in the first five months of this year totaled 320,906, compared with 333,938 in the corresponding period of 1923, a drop of less than 4 per cent.

In making this announcement, President A. P. Sloan, Jr., of the General Motors Corp., differentiates between sales of cars to dealers and deliveries of cars by dealers to consumers. This is a prelude to a statement by Mr. Sloan that hereafter there also will be issued monthly reports on cars delivered to consumers.

In his statement, he says:

I have recently noted various articles in the press dealing with the reduction in activity in the motor car industry and citing current production figures as an indication of such a trend. While production is at present below the level of the past winter and early spring months, due to the policy of reducing dealers' stocks, it should be recognized that the real index is the rate of deliveries by dealers to the consumer. Obviously production must sooner or later be adjusted to that trend.

Heretofore, it has been the custom of General Motors to publish only figures of sales of cars to dealers. In order, however, to permit a more adequate analysis of the situation General Motors will in the future issue monthly figures showing both sales to dealers as well as deliveries of cars to the consumer.

## Ford Making Study of Accessory Field

(Continued from page 1350)

purchaser gets the advantage of time payments on the accessories and the difference in the cost spread over a period of months is so slight as to make their sale practically certain.

No announcement is made by the company as to its plans for the manufacture of the items as, with the exception of the number that are now being made for standard equipment on the closed models, it has not fully determined its action. The company has facilities now existing for the manufacture of any or all the equipment specified in its many manufacturing plants about the country and is already making glass, lamps, wheels and other items at various points.

The attitude of the company for some time has been that it should be participating in the accessory business that the sale of the car has made possible. The reason that it has not undertaken a larger activity in this direction previously has been due to the fact that it has been concentrating entirely upon getting its manufacturing facilities up to a point fully covering the market for the car.

That the manufacture of accessories is now receiving serious consideration indicates that with its car manufacturing facilities now at a point aggregating 10,000 daily when required, it will not seek further expansion in this field for some time. Its plans for production facilities on parts and material entering the car may also be regarded as practically complete.

## FINANCIAL NOTES

Sparks-Withington Co. has declared an extra dividend of 50 cents a share on the common in addition to the regular quarterly 50 cent dividend. The company has also declared the regular quarterly dividend of 1% per cent on the preferred. All dividends are payable July 1 to stock of record June 20.

Edmunds & Jones Corp. has voted to pay an extra dividend of 50 cents a share on the common, in addition to the regular dividend of 50 cents on the common and 1% per cent on the preferred. This is the same action as taken in the previous four quarters.

Kelly-Springfield Tire Co. has passed the regular quarterly dividend of 1½ per cent on the 6 per cent preferred which is due at this time and which has been paid uninterruptedly since 1914.

Spicer Manufacturing Co. has declared the regular quarterly dividend of \$2 a share on the preferred, payable July 1 to holders of record June 20.

## Fisk Rubber Announces 15 Per Cent Price Cut

NEW YORK, June 19—The Fisk Rubber Co. announced this morning a price reduction which as yet has not been followed by the other big companies. High pressure cords from 32 x 3½ to 37 x 5 have been reduced 15 per cent, while the cut on balloons average from 15 to 20 per cent. Following the balloon reductions, the company has withdrawn its offer of free wheels and rims.

## 1926 Indianapolis Race to Be for 91½ In. Cars

INDIANAPOLIS, June 19—Official announcement is made that the 500-mile race on May 30, 1926, will be open only to cars with a piston displacement maximum of 91½ cu. in., with the same weight limit as now prevails for the 122 in. cars, 1200 lb.

The management is giving manufacturers two years notice of the proposed change.

## DATES SET FOR SALONS

NEW YORK, June 18—Dates for the twentieth annual automobile salon in New York and Chicago are announced. The New York exhibition will be held in the Commodore as usual, Nov. 9 to 15 inclusive, while the Chicago display will be held the last week in January.

## Citroen Cuts Prices for English Market

Average Reduction Is 10½ Per  
Cent, Biggest Change Being  
Made with Coupé

LONDON, June 10 (by mail)—British light car manufacturers, notably such firms as Morris, Standard and Singer, have been more or less anxiously awaiting some announcement concerning the expected reductions in the prices of Citroen cars on account of the pending removal of the import duty on the first of August.

This announcement has now been made, and it is found that the average cut is no more than 10½ per cent. The biggest reduction applies to the 7.5-hp. coupé, 17¼ per cent, and the smallest to the French-bodied four-seater of the 11.4-hp. model, 4¼ per cent.

The following table shows how typical examples of the new Citroen prices and specifications compare with the corresponding models of the three British makes mentioned:

CITROEN		
7.4 hp.	11.4 hp.	11.4 hp.
Two-seater	Four-seater	*Four-seater
£160	£225	£270
51 cu. in.	88 cu. in.	88 cu. in.
88-in. wheel-	114-in. wheel	114-in. wheel-
base	base	base
46-in. track	47-in. track	47-in. track

\* English bodywork.

MORRIS		
11.9 hp.	11.9 hp.	13.9 hp.
Two-seater	Four-seater	Four-seater
£198	£225	£320
93 cu. in.	93 cu. in.	109 cu. in.
102-in. wheel-	102-in. wheel-	102-in. wheel-
base	base	base
48-in. track	48-in. track	48-in. track

STANDARD		SINGER
11 hp.	14 hp.	10 hp.
Two or Four-	Two or Four-	Four-seater
seater	seater	
£235	£375	£235
85 cu. in.	117 cu. in.	67 cu. in.
105-in. wheel-	116-in. wheel-	96 in. wheel-
base	base	base
51-in. track	54-in. track	46-in. track

Essex, Hudson, Maxwell and Moon prices have been reduced already to the full extent permitted by the prospective free imports of cars. The average reduction in these cases is approximately 12 per cent, the smallest being 7 per cent on the previous price of the Essex coach.

## Ford to Give Refund

The Ford Co., Manchester, has announced that immediate buyers at current prices will receive a refund if any reduction is made on Aug. 1, but points out that, as 92 per cent of the Fords sold in England are British-made, no material alteration in price is likely to occur by reason of the removal of the duty. General Motors' representation is making a similar offer.



## Timken Axle Limits Field of Production

### Company Decides to Discontinue Manufacturing for Low and Medium Priced Cars

(Continued from page 1350)

On the whole, the business has been decidedly unsatisfactory, executives declare, and it is doing its part to shrink down the capacity to an extent more in conformity with the amount of business to be obtained.

Bankers have assured them, executives say, that they are taking a courageous and constructive position, which will result not only favorably for themselves but the industry as a whole.

Under its plan of concentrating upon axles for high-grade passenger cars, buses and trucks, the company declares that it will be in much better condition to take care of its business generally.

Plans which had been under way looking to the manufacture of parts for the replacement field are off, under the new plan of operations, it is declared. The company will carry through all servicing on axles which it has made, but will not manufacture for the general replacement market.

#### Letter to Stockholders

The company's letter to its stockholders, announcing this change of manufacturing plans, is as follows:

The natural desire on the part of the directors to earn profits sufficient to resume common stock dividends, has led to very serious consideration of our problems. We believe that a satisfactory solution has been reached and submit herewith our decision. To the casual observer this step may seem radical, but in the opinion of those of us who are in daily contact with the industry as a whole, it is constructive, and is a necessary result of changed conditions.

For the past few years the operations at our Waterloo Avenue plant have been unprofitable. Since the post-war boom there has been greater axle capacity than the industry needed. The resulting competition has been so keen that contracts for large quantities of the smaller sizes of axles have been taken at cost or less, in an effort to keep the plant filled up and thereby reduce the cost of the larger sizes.

Even this has not been successful because of the failure of our customers to take the quantities contracted for, and the inevitable increase in overhead expenses when schedules are radically reduced. Furthermore, our organization is trained to build only one quality of product, and we find it impossible to build at a profit a quality axle, and sell it at a quantity price.

Therefore, the directors have decided to close the Waterloo Avenue plant and the Standard Equipment plant in Cleveland, and to discontinue the manufacture of axles for medium and low priced cars, and to confine our efforts on passenger car axles to the few makes of cars which require and can pay a fair price for a product of the highest quality.

For many years our Clark Avenue plant has been manufacturing axles for trucks and for a few high priced passenger cars. During

the past three years the demand for bus axles has been gradually increasing, until now it is an important factor. All of this business demands the highest quality of workmanship. We now plan to add to this volume the quality business which we retain from our other plants. By doing this we will comfortably fill the Clark Avenue factory, and will be able to manufacture economically, as we will have a large volume of high grade work confined to one plant.

The value of the machinery and equipment which is no longer to be used and for which there is no immediate sale, will be written off the books. This equipment will then be liquidated as advantageously as possible, resulting in a large saving annually in depreciation and maintenance.

The land and buildings will still be carried on the books, and it is expected that the fireproof buildings can be leased for a sufficient sum to cover all fixed charges on the property, until such time as it can be disposed of to advantage.

Current inventory of parts for the axles we are discontinuing will be reduced to a minimum before the plant is closed, and in so far as possible, any surplus will be sold to our competitors who take over the manufacture of these models. Patterns, dies and tools for these models will be similarly disposed of.

#### Surplus of \$800,000

After the reduction of the plant account mentioned above there will still remain total net tangible assets of approximately \$3 for every dollar of preferred stock outstanding. The book value of the common stock will be reduced from \$15.50 to about \$11 per share, leaving a surplus of approximately \$800,000. The financial position of the company will be materially improved, as we will have the same amount of liquid capital with which to do a smaller and more profitable volume, and there will be left on the books plant investment commensurate with the potential amount of desirable business.

The directors have reached the above decision only after very careful deliberation covering a period of several months. From an exhaustive analysis of the operations of the last few years they are convinced that shrinking the business into one plant and giving up the unprofitable lines will result in a still higher reputation for Timken quality, and in far-reaching economies in manufacture and administration to the ultimate benefit of the stockholders.

## INDUSTRIAL NOTES

**Gisholt Machine Co.**, Madison, Wis., has purchased the business of the Millholland Machine Co. of Indianapolis, which was recently forced to liquidate after a receivership. The purchase includes the stock of finished machines, part in process, goodwill, trade marks, patents, drawings, jigs, tools, fixtures, etc. The business will be continued at Madison by the Gisholt company.

**Hammer-Spray Co.**, New Haven, Conn., has licensed the Knox Motors Co., of Springfield, Mass., under its patents relating to its system of using oil as fuel in gas engines. The Knox company is preparing to place the attachment on the market.

**Hupp Motor Car Corp.** plans to increase its plant facilities by the construction of a block test building, 50 x 150 ft., to cost about \$35,000. The company also plans to erect a large steel storage building.

**Hutto Engineering Co.** of Detroit has moved its plant and offices to a new location in that city at 515 Lyncaste Ave.

## METAL MARKETS

Frequently, as one encounters in the market for steel products these days the comment that "things are going from bad to worse," the facts do not bear out this shallow observation. Demand is at a comparatively low level, it is true, and before the present lack of buying appetite gives way to a quickening of consumers' needs, it is possible, yes even probable, that many of the steel mills will have hard sledding to unearth sufficient orders to keep two-fifths of their capacity in operation.

Sooner or later, however, the country's natural growth is bound to restore a more normal steel consumption, and meanwhile there is, from the producer's point of view, much solace in the fact that, although the demand for steel, roughly speaking, has been cut in half in the last three months, prices have given way only to the extent of about 10 per cent in that time. There is today in evidence in the automotive steels a somewhat ragged market condition, this or that mill eager for a certain order, no matter how insignificant the tonnage involved, being willing to cut perhaps \$3 or \$5 a ton under the quotation of some other mill which for the time being may not be compelled to bare its need of business.

There has been nothing, however, that could be construed as a liquidation of prices commensurate with the sharp cut in demand. Sheet bar prices, which after all determine the price that automotive consumers must pay for their sheet requirements, remain at \$40, and \$45 was looked upon as the limit imposed by sanity in the days when non-integrated sheet rollers were more concerned about their supply of sheet bars than the price. What other staple commodity in the face of a cutting in half of the demand has ever maintained values to the extent recorded by the steel market in this crisis?

There is no doubt that a critical situation confronts the steel industry. Ostensibly for some time to come there will be a wide gap between the capacity of mills and the demand made upon them. Light as buying by automotive consumers is, it is more even and more dependable than that of the construction and railway equipment industries which seem to have covered fully the shortage suffered as the result of the war's aftermath. All signs indicate that the demand for steel is turning the corner, and that instead of "going from bad to worse," it will slowly improve as this presidential election year grows older.

**Pig Iron.**—Buying by automotive foundries is restricted to single cars, and even on these concessions of 50 cents a ton from the nominal market are frequently made.

**Aluminum.**—The relatively light demand for automotive requirement is easily satisfied, but prices hold fairly steady. This is largely due to the fact that arrivals of imported metal earmarked against previous contracts are generally accepted by the buyers and kept in reserve by them. Very little virgin metal is pressing for sale in the "outside" market. The sole domestic producer enjoys a routine volume of second-half contracts from regular customers. The London market is easing off.

**Copper.**—Production returns show that all the sermonizing of curtailed output being the market's sole salvation is having very little effect. Automotive demand for copper and brass products is light.

**Tin.**—Quiet and easy. Much tin is being held for a higher market.

**Lead.**—The market has firmed, and spot lead is not at all plentiful.

# Calendar

## SHOWS

- Jan. 2-10—New York, National Automobile Show, under the auspices of the National Automobile Chamber of Commerce, Bronx Armory.
- Jan. 24-31—Chicago, National Automobile Show, under the auspices of the National Automobile Chamber of Commerce, Coliseum and First Regiment Armory.

## FOREIGN SHOWS

- July 1-15—Dunkirk, France, Northern European Fair, Headquarters, No. 2 Rue Gaspard Malo, Dunkirk.
- Aug. 23-Sept. 2—Bratislava, Slovakia, International Danube Fair.
- Aug. 23-Sept. 6—Toronto, Ont., National Automobile Show in conjunction with the Canadian National Exhibition under the sanction of the Canadian Automotive Equipment Association and the Automotive Industries of Canada.

September—Vienna, Austria, Vienna International Fair.

Sept. 21-28—Prague, Czechoslovakia, Prague Autumn Fair.

Oct. 2-12—Paris, passenger cars, motor cycles, bicycles and accessories, Grand Palais.

Oct. 17-25—London, Annual Passenger Car Show, Olympia.

Oct. 22-31—Paris, motor trucks, stationary engines, garage tools and machine tools, Grand Palais.

## RACES

- July 4—Kansas City.
- Aug. 3—Lyons, France, European Grand Prix.
- Sept. 1—Altoona.

Sept. 1—Syracuse.

Sept. 7—Monza Track, near Milan, Italy, Italian Grand Prix.

Oct. 4—Fresno.

Oct. 19—Kansas City.

Nov. 24—Los Angeles.

## CONVENTIONS

June 24-27—Atlantic City, American Society for Testing Materials.

Sept. 8-11—Eaglesmere, Pa., Annual Meeting of the Automotive Electric Association.

Sept. 22-26—Boston, Sixth Convention and International Steel Exposition of the American Society for Steel Treating.

Jan. 5—New York, Convention under the auspices of the National Automobile

Dealers Association, Hotel Commodore.

Jan. 26-29—Chicago, Eighth Annual Convention of the National Automobile Dealers Association, Hotel LaSalle.

## S. A. E. MEETINGS

June 24-27—Summer Meeting of the S. A. E., Spring Lake, N. J.

September—New York City, S. A. E. Automotive Transportation Meeting.

Oct. 21-24—S. A. E. Production Meeting, Detroit.

Nov. 18-19—Joint Service Meeting of the S. A. E. with the N. A. C. C. Cleveland.

—Aeronautical Meeting at Dayton at the time of the Pulitzer Races.

January—S. A. E. Annual Meeting, Detroit.

## Some Cities Report Surplus of Workers

WASHINGTON, June 18—In company with other industries, the automobile industry during the month of May continued to show a surplus of workers with many plants operating on a slow basis, it is revealed here in the monthly digest of general employment conditions, made public by the employment service of the Department of Labor.

"In Michigan, however," the digest states, "it is felt that the industry is making progress at this time, and schedules for June are ahead of those for May."

At Rochester, N. Y., it is reported that the industries manufacturing automobile parts are operating overtime and "employment conditions in this line are very satisfactory."

In the Harrisburg, Pa., district it is reported that seasonal activities in the automobile repair shops and garages have increased the demand for truck drivers, helpers and mechanics.

## Reports of Districts

Following are concise reports from the principal automobile centers:

Detroit industrial district, including Hamtrac, Highland Park and Wyandotte—Most plants are running, though some, such as the automobile plants, are operating only part time. Approximately 20,000 workers are working an average of 42 hours a week in place of a normal 50-hour week.

Flint, Mich.: There is a surplus of workers here, and at this time three automobile plants are operating only part time, affecting 27,100 workers.

Kalamazoo, Mich.: A motor-car company and a cab company have been closed down completely for some time, affecting about 500 in both places.

Muskegon, Mich.: At this time there is a surplus of workers in foundries and plants related to the manufacture of automobiles.

Jackson, Mich.: There is a surplus

of factory workers and semi-skilled men in the automotive lines.

Saginaw, Mich.: A motor company is placing machinery in an old plant here, employing about 80 men.

Indianapolis, Ind.: There is a surplus of workers in automobile lines and reductions in working forces have taken place. Two automobile plants are running on part-time schedules.

South Bend, Ind.: Last month one automobile plant released some workers; all factories are operating, but not on full-time schedules.

Muncie, Ind.: There is considerable unemployment among automotive workers in this city.

Syracuse, N. Y.: Automobile plants, employing a like number of workers, are operating three days a week, and a gear manufacturing plant, employing 5000 is working only four days a week.

Troy, N. Y., including Watervliet, Green Island and Cohoes: Automobile plants at Green Island have reduced their working schedules to five days a week.

Fond du Lac, Wis.: All plants are running, except a tire company, which is operating only 40 per cent of capacity.

Toledo, Ohio: There is a surplus of workers in the automobile and automobile accessories industries at the present time, owing to many workers being laid off from some of the larger factories.

## Montana Tractor Sale Scheduled for July 14

OCONTO, WIS., June 16—The property of the Montana Tractor Co., consisting of a manufacturing plant established about four years ago, will be offered for sale at public auction on July 14 by the sheriff to satisfy two judgments, one of \$1,321 held by George M. Smith, and the other of \$625 held by the Reliable Tractor & Engine Co., Appleton, Wis. Efforts are now being made to satisfy the judgments before the date of sale and thus keep the industry intact.

## Reservations Made for S. A. E. Meeting

(Continued from page 1357)

trucks and tractors. A. R. Squyer will report on the experiences of the Holt tractor engineers, while L. L. Dollinger, P. S. Tice and others, who have given air-cleaning exhaustive study, also will contribute papers.

The only demonstration scheduled is that of the Weiss transmission, which will be of interest because of the papers prepared on the subject of transmissions. On this subject Prof. J. M. Nickelsen of the University of Michigan will present a summary of what has been done in this field and discuss the promise of new transmissions in the future. In addition G. W. Cate, W. A. McCarroll and a representative of the Weiss Engineering Association will describe new and interesting transmission mechanisms.

The program of the week is as follows:

Tuesday, June 24.—Session on riding quality in afternoon; semi-annual business meeting of the Society in the evening, followed by dancing and entertainment; demonstrations related to riding quality.

Wednesday, June 25.—Session on oil dilution and contamination in the morning and continued in the evening; athletic tournaments start in the afternoon; golf, tennis, trapshooting and baseball; dancing in the evening.

Thursday, June 26.—Meeting of the Standards Committee during the morning; annual S. A. E. field day during the afternoon and continuation of all tournaments; session on air-cleaners in the evening; grand ball.

Friday, June 27.—Session on new transmission systems at the morning meeting; annual S. A. E. water carnival in the afternoon; finals in golf, baseball, tennis and trapshooting; meeting closes after dinner.

## UNITED MOTORS BRANCH

DETROIT, June 16—The St. Louis headquarters of United Motors Service has been moved to the Haas Building, Locust Street and Jefferson Avenue.